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By the Fortune staff



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## The New Reality?

In "The 21st-Century Corporation: Every Aspect of Your Business Is About to Change" (Nov. 1), we are told to imagine an economy without friction, in which labor, information, and money move freely. Really, though, "friction" in an economy means jobs, and jobs mean livelihoods for people. Not everyone is going to be able to dominate or create the new field, so what about everyone else? Are they going to squabble over the scraps? For how long? As our population increases, is it really the most morally and ethically correct course of action to move toward a frictionless economy?

Matt Herrmman  
via *Fortune.com*



## Listen Up

In "40 Under 40: The Best Advice I Ever Got" (Oct. 1), you missed the one piece of advice I pass on to my children and grandchildren: "Everyone you meet in life knows more about *something* than you do. Your job is to get them to pass that knowledge on to you!"

William Beasley  
Largo, Fla.

## Pricey Pills

Re "The U.S. Has the Highest Drug Prices in the World. And Hating Martin Shkreli Won't Be Enough to Change It" (Nov. 1): Don't blame Big Pharma for high prices; blame the FDA. The

cost of getting a new drug approved is ridiculous. It's a typically wasteful government process.

Roland Underhill  
Greenbrae, Calif.

## Back to Black

"The New Geek Squad (That's Fixing Best Buy)" (Nov. 1) is one of the clearest and most knowledgeable turnaround reports I have read anywhere. You are to be congratulated on a detailed and thoughtful analysis of what may be one of the most important stories in the history of U.S. retailing.

Edward Gottesman  
London

## Down the Hatch

In "The Siege of Herbalife" (Sept. 15), Roger Parloff's reporting makes for edge-of-your-seat reading. It seems that activist investor Bill Ackman underestimated the will of his opponent and the true nature of this multilevel marketing company's business. With no victims, the vast majority of products going to real customers, and the changes in CEO Michael Johnson's business as motivated by hedgers at the gate, I'm betting Ackman will be the biggest loser (without drinking a shake) in this drama.

Bill Florin  
Monroe, Conn.

## CORRECTIONS

"Nike's Master Craftsman" (Dec. 1) said the 2012 Olympic Games took place in Beijing; they were in London. In "The Would-Be Wi-Fi Kings" [Dec. 1], a chart showing the wireless spectrum was mislabeled. The lower frequencies should have been identified as having longer wavelengths; higher frequencies have shorter ones.

## LETTERS TO THE EDITOR

Please include your name, address, and daytime phone number. Letters may be edited for clarity and space.

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# Pfizer's Desertion



**GIVE PFIZER CREDIT** for doing what no one thought could be done: It has united the fractured landscape of American politics. There was not a hint of disagreement among the presidential candidates—who can agree on nothing else—in responding to the company's decision to move its tax domicile to Ireland. Donald Trump called it “disgusting.” Bernie Sanders deemed it “disastrous.” Hillary Clinton said the company is leaving “U.S.

taxpayers holding the bag.”

It's almost—almost—possible to feel sorry for Pfizer CEO Ian Read. After all, his is a rational response to the irrational tax laws that the politicians have put in his way. My colleague, Geoff Colvin, defends him by saying he is simply fulfilling his “fiduciary duty to serve his shareholders' interests.” And that argument holds, if you look only at the short term.

But here's the problem. Pfizer exists at the intersection of two muddled messes of American public policy—our corporate tax system and our drug-pricing system. The first hurts the company by combining one of the highest corporate tax rates in the world (35%) with a global reach that

leaves American companies at a serious disadvantage against their foreign competitors while it drives them to park billions of dollars in overseas earnings outside the U.S. to escape punitive taxation. The second, however, works greatly to Pfizer's benefit. The U.S. alone among major nations prohibits the government from regulating or negotiating drug prices, allowing companies to reap their greatest profits in the American market.

Both policies need to be fixed. And however unlikely it may seem at the moment, both will be fixed, eventually. The status quo—with more companies fleeing the country every year while pharmaceutical corporations like Turing and Valeant jack up drug prices to obscene levels—is unsustainable.

The real question is how they will be fixed. Will Congress attempt to build a Berlin Wall around U.S. companies and impose heavy-handed regulation on drug prices? Or will it find a way to allow American pharmaceutical companies to compete fairly in the world and earn sufficient profits in the U.S. to incentivize research? It's in Pfizer's interest, the industry's interest, and the nation's interest that we take the second path. But Pfizer's desertion—and there's no other word for the 160-year-old company's decision to change

tax domiciles—will inflame the growing antibusiness elements in both political parties and increase the likelihood of following the first, counterproductive path. In that respect the company is selling its future. It's a bad decision, and the consequences will be long-lasting.

Sharp readers among you will notice that on page 93 of this issue, in our annual investor's guide, we recommend investing in certain pharmaceutical stocks. To that recommendation I add a footnote: These investments may pay off nicely in the short run. But in the longer run, thanks to the decisions of companies like Pfizer, Valeant, and Turing, a harsh political reckoning is coming. For a deeper dive on this hot-button topic and much more of what the markets hold in store, read our fascinating investor roundtable on page 102. The headline frames not only the story but the entire issue well: “Where Do We Go From Here?”

We've got some smart, timely answers.

ALAN MURRAY  
Editor

[@alansmurray](https://twitter.com/alansmurray)



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CEO, PUBLIC LIGHTING AUTHORITY OF DETROIT

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# Macro

CLOSER LOOK



## JAPAN IS AGING. IT'S NOT ALONE

The country's growth is sputtering, its debt load is unrivaled, and its population is the world's oldest. Japan's economy has serious problems—they could soon become our problems too.

By Chris Matthews

**IN A YEAR** with no shortage of scary economic stories, Japan's recent woes may be the globe's most chilling cautionary tale. The world's third-largest economy shrank by 0.8% in the third quarter of 2015, sending the country into its fifth recession in seven years in November.

That's despite the herculean efforts of Prime

Seniors exercise at a temple in Tokyo. The ratio of old to young people in Japan is growing as the overall population shrinks.

Minister Shinzo Abe to rescue the country from the grip of disinflation and negative growth. His plan to jump-start the economy—a multibillion-dollar combination of massive stimulus, structural labor reforms, and

monetary easing—has fallen flat, partly because of escalating political pressure. But the real reason goes deeper: Japan's population, the world's oldest, is shrinking.

The archipelago's population has fallen 0.6% in the past decade, while the share of the population older than 65 has risen from 20.4% to more than a quarter. The result is that Japanese companies, facing the prospect of a smaller market for goods, see little reason to invest in new capital spending. And although government intervention has kept unemployment low, real wage growth has been stagnant, giving Japanese consumers little reason to increase their spending either.

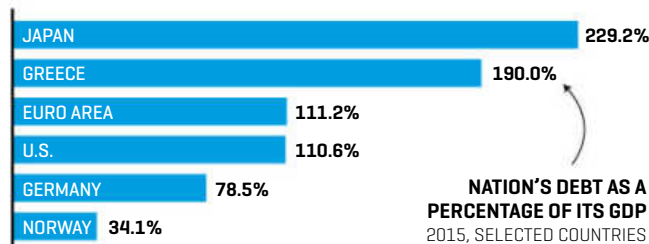
Compared with the rest of the world, though, Japan may not be worse so much as early. Large economies, such as those in the U.S., China, and Germany, are all projected to have 22% of their population over age 65 by 2050, which has vast implications for economic growth and publicly funded social safety nets. Japan's debt-to-GDP ratio is the highest in the world, but looming obligations could cause others to balloon as well.

"This is a new experience

for us," says Carl Weinberg, chief economist with High Frequency Economics. The rich world has historically taken its collective steady economic growth for granted. Japan, he says, "is a reality check."

There's a limit to how much the government can do to alleviate the problem. Japan's quantitative-easing program (far larger in scale than equivalent efforts in the U.S.) has the Bank of Japan buying 80 trillion yen's worth of government debt each month. At that rate of purchase, the central bank would own every last dollar of Japanese government debt by the year 2027, though the currency would collapse before that happened.

How can the world avoid a fiscal storm similar to the one now brewing in Japan? It can start by thinking differently from the Japanese on immigration. Despite the panic they increasingly evoke in political circles, younger immigrants can help offset declining birthrates and an aging population. All the stimulus in the world can't make Japan's population grow. "Japan doesn't need liquidity," Weinberg says. "It needs people." **F**



THE OPIOID ANTAGONIST NALOXONE, OR NARCAN, INSTANTLY STOPS THE EFFECTS OF A DRUG OVERDOSE WHEN ADMINISTERED.

#### OFF-LABEL EPIDEMIC

## THE WAR ON DRUGS FINDS A WEAPON

**FOR DECADES**, naloxone, a drug approved in 1971 that instantly reverses the effect of opioid overdose, languished in relative obscurity. Outside of emergency rooms and outreach programs in high-risk communities, few saw the

public-health potential. Many even argued that it encouraged substance abuse.

Not anymore. Today school nurses, police officers, and firefighters increasingly carry naloxone. New laws in 37 states allow friends and family members of opioid users to obtain a prescription. The FDA has called for more user-friendly forms of the drug—it approved a nasal-spray version in November. And 29 states have issued standing orders that effectively make it available over the counter.

The increased adoption is driven, of course, by the nation's deepening opioid epidemic—a scourge fueled by prescription pain pill abuse and cheap heroin that resulted in 24,200 overdose deaths in 2013, up 315% from 1999. Estimates put the cost of the epidemic at \$55 billion to \$72 billion a year.

Naloxone's rise to prominence has been good for its manufacturers, Amphastar Pharmaceuticals and Pfizer, which both doubled the price over the past two years. [Three other companies, Mylan, Kaléo, and Adapt Pharma, also recently entered the market.] But more significant: It saved 8,000 people from an overdose last year—a number that's growing fast. —Erika Fry

**HOW CAN WE** MAKE SENSE OF VAST AMOUNTS OF COMPLEX AIRLINE DATA WITH A MYRIAD OF VARIABLES, CRUNCHING 6 HOURS OF INTENSE CALCULATIONS INTO 1 MINUTE, SO THAT HIGHLY VALUED CUSTOMERS LIKE STEVE MURRAY OF BROOKLYN DON'T SPEND HOURS WAITING AT THE AIRPORT FOR A DELAYED FLIGHT THAT WILL EVENTUALLY BE CANCELED, WHEN HE COULD HAVE STAYED HOME CELEBRATING HIS DAUGHTER'S SEVENTH BIRTHDAY? **IT'S SIMPLE. THE ANSWER IS SAP HANA.**

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Run Simple





A MAN WALKS THROUGH FLOODWATERS IN NEW JERSEY IN THE AFTERMATH OF HURRICANE SANDY, A STORM, MANY FEAR, THAT WAS A PREVIEW OF THE HIGH COSTS OF CLIMATE CHANGE.

CATASTROPHES INC.

# The C-Suite Climate Converts

By Vivienne Walt

**COSTLIEST NATURAL DISASTERS SINCE 1980**  
(INSURED LOSS, ADJUSTED FOR INFLATION, IN BILLIONS)



## AT A BLACK-TIE EVENT

in an opulent ballroom late in 2014, a grim figure at a podium warned of the “catastrophic impact of climate change.”

“While there is still time to act,” he admonished, “the window of opportunity is finite and shrinking.”

A celebrity environmentalist’s jeremiad? Hardly. The speech, made in front

of a spellbound audience of insurance executives in London, was delivered by one of the financial world’s most sober figures: Bank of England governor Mark Carney. His message was simple: Climate change is coming, and it’s very bad for business.

As more than 100 heads of state converge in Paris in December for the 2015 United Nations Climate Change Conference, business leaders will play a larger-than-ever part in the discussions. Executives were once hesitant to impede manufacturing efficiency or dampen consumption. Now nine out of 10 of them see climate change as an urgent priority, according to a survey by Accenture. “The first reaction of Big Business is denial,” says Philippe Desfossés, CEO of the \$27 billion French public pension fund ERAFP. But

denial has become increasingly difficult as environmental costs mount. "This is not about morals whatsoever," Desfossés says.

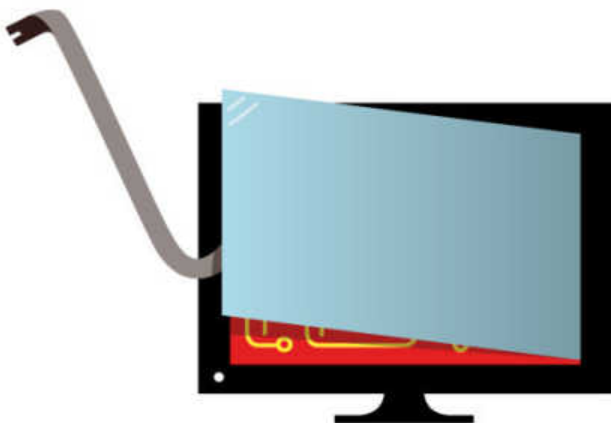
So far the insurance industry has led the charge—and with good reason. Early on "there was a gut feeling that the patterns of natural catastrophes were changing," says Peter Höppe, director of Geo Risk Research at Munich Re, which first sounded the alarm in 1973. Since then its message has gained resonance. The number of weather-related events covered by insurance has tripled since the 1980s, and the cost has jumped from \$10 billion annually to some \$50 billion.

It's not just the insurance industry that's taking note. Even more so than wars or subprime loans, a wild-card climate calamity could put the entire global economy in a tailspin. At the same time, divestment campaigns have prompted cities and governments to increasingly dump fossil-fuel stocks. And New York is investigating whether Exxon Mobil misled investors by downplaying climate risk—a case that could cost the company substantially.

But economic self-interest alone may not be enough to spark real progress, particularly because the worst effects of climate change are still a generation away. Leaders can't afford to wait. Says Carney: "Once climate change becomes a defining issue for financial stability, it may already be too late." ■

#### CYBERCRIME

## HOSTAGE NEGOTIATION GOES DIGITAL



THIEVES ARE INCREASINGLY HOLDING DIGITAL DATA FOR RANSOM—FORCING USERS TO FORFEIT SENSITIVE INFORMATION OR PAY UP.

IN THE SPRING OF 2014, Mark Schneider's computer became progressively more sluggish until this message appeared: "Your important files were encrypted on this computer." Suddenly all his digital assets—the bookings, the down payments, the deposits of the soon-to-arrive summer patrons at his small Ontario fishing resort—were rendered inaccessible. Perhaps more disturbing was what the note went on to say: "To retrieve the private key"—the secret pass code that would unlock his electronic property—"you need to pay."

Incidents of digital ransom, or ransomware, have soared in recent years. One study determined that a single campaign—a malevolent program called

CryptoWall 3.0—may have earned its developers more than \$325 million in payments such as the one solicited from individuals and businesses like Schneider's.

The surge has prompted tough questions for law-enforcement officials, forcing them to rethink the old playbooks on traditional hostage taking and theft. "To be honest," FBI agent Joseph Bonavolonta reportedly said at a recent conference in

Boston, when other options are no longer viable, "we often advise people just to pay the ransom." (The FBI officially recommends data backups, threat-detection software, and general caution online.) Some security experts argue that forking over cash enables robbers to profit off the racket and bankroll more hacks, but when the choice is to negotiate with cybercriminals or lose your data, untold numbers simply pay up.

The better route? Plan ahead. Shortly before the attack, Schneider signed up for a cloud-based data backup service, which enabled him to regain complete control of his files without paying anything (beyond the service's subscription fee, of course). He was back to booking wall-eye and lake trout expeditions in no time. The phishers, however, are still at large. —Robert Hackett

#### TEST CASES

### JOE'S CRAB SHACK JOINS THE NO-TIPPING MOVEMENT

This winter harried restaurant workers of America will be watching Joe's Crab Shack. In November, Joe's became the first national chain to ban tipping—testing the practice at more than a dozen locations. The reasoning? Less reliance on tips gives workers a more stable income, says COO David Catalano. As part of the deal, employees' base salaries go up to about \$12 per hour, and customers will be charged 12% to 15% more to offset costs. If they pay it, more chains could follow suit. —Benjamin Snyder



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## GOOD EATING

# YOU'RE GOING TO START HEARING A LOT MORE ABOUT GIANT CHICKENS

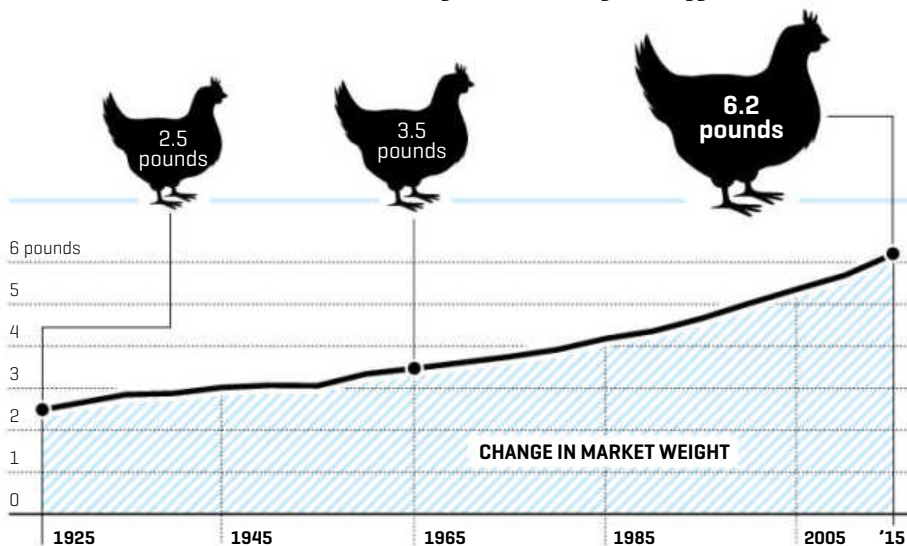
**LAST MONTH** Taco Bell became the latest of the major fast-food chains to commit to serving eggs only from cage-free hens. The brand behind Cap'n Crunch doughnut holes and Doritos taco shells was the deciding vote in the animal-rights debate: Cage-free eggs are now the norm.

But while the chickens may have flown the cage, the animal-welfare debate rages on. The next front: "fast growth" broiler chickens. For years the poultry industry has intentionally bred its birds to get bigger faster on less feed. In 1925 the average broiler

chicken weighed 2.5 pounds when it went to market at 112 days old. Today the average goes to market after just 48 days at 6.2 pounds—essentially we've created giant chickens.

That's great for efficiency but maybe not so great for chickens. The Humane Society of the U.S. says the practices can inflict broilers with leg disorders, weakened immune systems, and cardiovascular problems.

Some of the biggest food companies—General Mills and Nestlé and food service giants Aramark and Compass Group—have acknowledged that fast-growth poultry is an issue to at least discuss. Companies say they are "working to understand" or "working with [their] suppliers to address" it. Definitive language, no—but it sounds a lot like what companies said in the early days of cage-free eggs. —Beth Kowitz



## WORD CHECK

## ratchet

\ 'ra-çæt \ n.

An anti-dilution mechanism that guarantees private investors additional shares if the IPO price of a company doesn't reach a certain level. The tactic, used with "unicorns" like Box and Square, is a sweet deal and incentive for backers—most likely adding to the Valley's frothy valuations.

## AND SOLD!

## THE ANATOMY OF A RECORD-BREAKING SALE



**THE NIGHT OF NOV. 9** in Manhattan, Christie's auctioned off Amedeo Modigliani's "Nu Couché," a painting of a voluptuous nude in dramatic color, smiling in a post-coital slumber. But more dramatic than the painting itself was its hammer price: \$170.4 million, shocking for an artist on no one's top 20 list.

The auction likely brought a windfall for Christie's, but a guarantee of at least \$100 million meant it was also a gamble. If the painting had sold at Modigliani's previous record of \$70.7 million, Christie's could have lost millions (though a third party stepped in at the last minute to guarantee a bid and share the risk).

More worrying: The night the Modigliani sold, 10 other works did not reach their high reserve prices and failed to sell at all. The auction business is tightening this year, a fact that the booming market for top-shelf works can't quite paint over.

—Don Thompson, author of *The Supermodel and the Brillo Box*, out in paperback this fall

## HITS AND MISSES



"Les Femmes d'Alger, Version O"

**EXPECTED: \$140 MILLION  
ACTUAL: \$179.4 MILLION**

In March, Pablo Picasso's colorful geometric oil became the most expensive painting ever sold at auction.



"Nymphéas," 1908

**EXPECTED: \$30-\$50 MILLION  
ACTUAL: \$33.8 MILLION**

Part of Monet's iconic Water Lilies series, it's one of a number of paintings that have come in on the low end of their price targets.



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## WORLD'S MOST ADMIRABLE COMPANIES

# Dancing in the Aisles

WAREHOUSE RETAILER COSTCO HAS BUILT A LOYAL BASE OF CUSTOMERS WITH LOW PRICES—AND WORKERS, WITH HIGH WAGES.

By John Kell

**I**T'S A RETAIL AXIOM: THE INTERNET has made it vastly easier for shoppers to hunt for the latest deal—and a lot more challenging for brick-and-mortar retailers to command loyalty. But Costco, which operates hundreds of members-only warehouses, has managed to defy the trend—with only 3% of its retail sales stemming from e-commerce. In fact, it outclasses other retailers when it comes to consistently increasing sales from its millions of faithful shoppers.

According to chief financial officer Richard Galanti, Costco's goal has been to boost sales while cutting long-term costs (by trimming freight



COSTCO COUNTS 81 MILLION MEMBERS IN NINE COUNTRIES.

expenses, scaling its merchandise, negotiating prices with vendors, and reducing packaging) so that it can pass those savings along to members. "Our rule of thumb is to give 80% to 90% back to the customer," Galanti says. Those efforts have paid off, with memberships reaching an all-time high of 81 million members in 2015.

Those dedicated shoppers

have helped put Costco at No. 16 on *Fortune's* list of the World's Most Admired Top 50 All-Stars, and it is currently ranked No. 1 among specialty retailers.

For the past six consecutive years, same-store sales have steadily increased, helping revenues leap from \$76 billion to \$114 billion.

Below, three ways Costco has kept its edge.

## COMPANY SNAPSHOT

**Headquarters** Issaquah, Wash.

**Employees** 205,000

**Revenues** \$114 billion

**Business** Warehouse retailer, with 686 locations in nine countries, including 480 in the U.S. and Puerto Rico

### BUILDING A FAN BASE

Renewals of Costco's \$55 annual memberships stand at an impressive 91%—a record high. According to analysts, the low price of memberships and a steady return of loyal members is what sets it apart from big-box and department store retailers, which continue to fight for market-share gains in a changing landscape of increased competition from online retailers, led by Amazon.

"Costco's ability to consistently drive increases in traffic is a key differentiator," explains Baird Equity Research analyst Peter Benedict.

### MINIMUM-WAGE TRENDSETTER

While Walmart and Target only recently began increasing wages, Costco has been an industry leader for years. With starting hourly pay at about \$11.50 and a company average of \$22 per hour, Costco's compensation trounces the competition. CEO Craig Jelinek says it can be more profitable in the long run by keeping turnover low and capitalizing on employee productivity.

Turnover stands at about 10%, compared with the industry norm of 55%. For employees who have been there more than one year, turnover drops to just 6%.

Loyal employees, the company says, result in better customer service.

### DITCHING AMERICAN EXPRESS FOR VISA

In early 2016, Costco will hand over its credit card program to Visa, ending a long-running relationship with American Express. Though the company is pretty tight-lipped about the decision, analysts say the change will result in lower costs for Costco and its cardholders—another way the company is helping customers save money. The change isn't expected to make a huge impact on memberships, but Telsey Advisory Group predicts a membership fee hike could occur in late 2016 or in 2017. **B**

# MOVE

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## EXECUTIVE READ

# THE GHOST IN THE MEMOIR

Everyone wants a book to promote; no one has time to write one. That's why authors for hire are thriving.

By Anne VanderMey

**T**

HIS YEAR, presidential candidate Hillary Clinton, college football coach Urban Meyer, and former Fed chair Ben Bernanke all released books that appeared on bestseller lists. And yet it's safe to say none of them had the time or inclination to actually sit down and *write* a book.

Enter the ghostwriter, a figure so ubiquitous that some literary agents estimate more than half of nonfiction titles nominally written by well-known people were not completely “written” by those people, even if they did do much of the scribbling themselves. Once stigmatized, ghostwriting and literary assistance have become routine, particularly as more non-writers seek authorship. “The expectation is that if you’re going to be a thought leader or you’re going to be taken seriously, you need to have a book,” says Dan Gerstein at New York City’s Gotham Ghostwriters, which acts as a kind of editorial employment agency, pairing would-be memoirists and gurus with wordsmiths.

It’s not hard to spot a book for which the author didn’t do 100% of the authoring. Clinton, Meyer, and Bernanke all are upfront about their collaborations. Business leaders in particular are happy to share credit, says ghostwriter Carlye Adler. “Do you really want your board to think you’re off on this other project?” Most of the time the ghostwriter’s or collaborator’s name ends up in the acknowledgements section (as in the financial crisis tell-alls by Bernanke, Tim Geithner, and Alan Greenspan). It can also land on the cover (see Peter Thiel’s co-author, Blake Masters, for *Zero to One*). Some collaborators never appear at all (political books and celebrity memoirs often keep writers’ names off entirely). Other times, a phalanx of people get credit (Hillary Clinton’s latest memoir thanked a three-person “book team”).

Depending on how involved the writer is, the

**TWO  
AUTHORS  
CAN BE  
BETTER  
THAN ONE**



## THE POWER OF BROKE

By Daymond John, with Daniel Paisner  
For help with his upcoming book, *Shark Tank* star Daymond John tapped Daniel Paisner, ghostwriter to the stars. Paisner’s other co-authors include linebacker Ray Lewis and tennis star Serena Williams.

## ABOVE THE LINE

By Urban Meyer, with Wayne Coffey  
Coffey, a *New York Daily News* sports reporter, also helped voice the stories of Major League Baseball pitchers Mariano Rivera and R.A. Dickey in addition to working on Meyer’s bestselling handbook.

## THE COURAGE TO ACT

By Ben Bernanke  
Beyond what he wrote himself, Bernanke credits the “superb editing, writing, and research” of former Associated Press reporter Dave Skidmore, who took a year’s leave from the Federal Reserve Board to help with the book.

actual interviews, writing, and rewriting can take anywhere from a couple of months to several years. “It’s a very intimate process,” says Madeleine Morel, who runs 2M Communications, a ghostwriting matchmaker. “You’re trusting them with your life story.” Still, it’s not uncommon to hear of “authors” neglecting to read the final product.

These days business is good for ghostwriters. The median going price is around \$50,000; that can easily triple for research-heavy projects. A few writers, however, command high six figures. How many ghosts get that kind of fee? “I’d say there’s 50 of them,” Gerstein says. “It’s hard to count them, though, because they don’t necessarily brag.” **TS**

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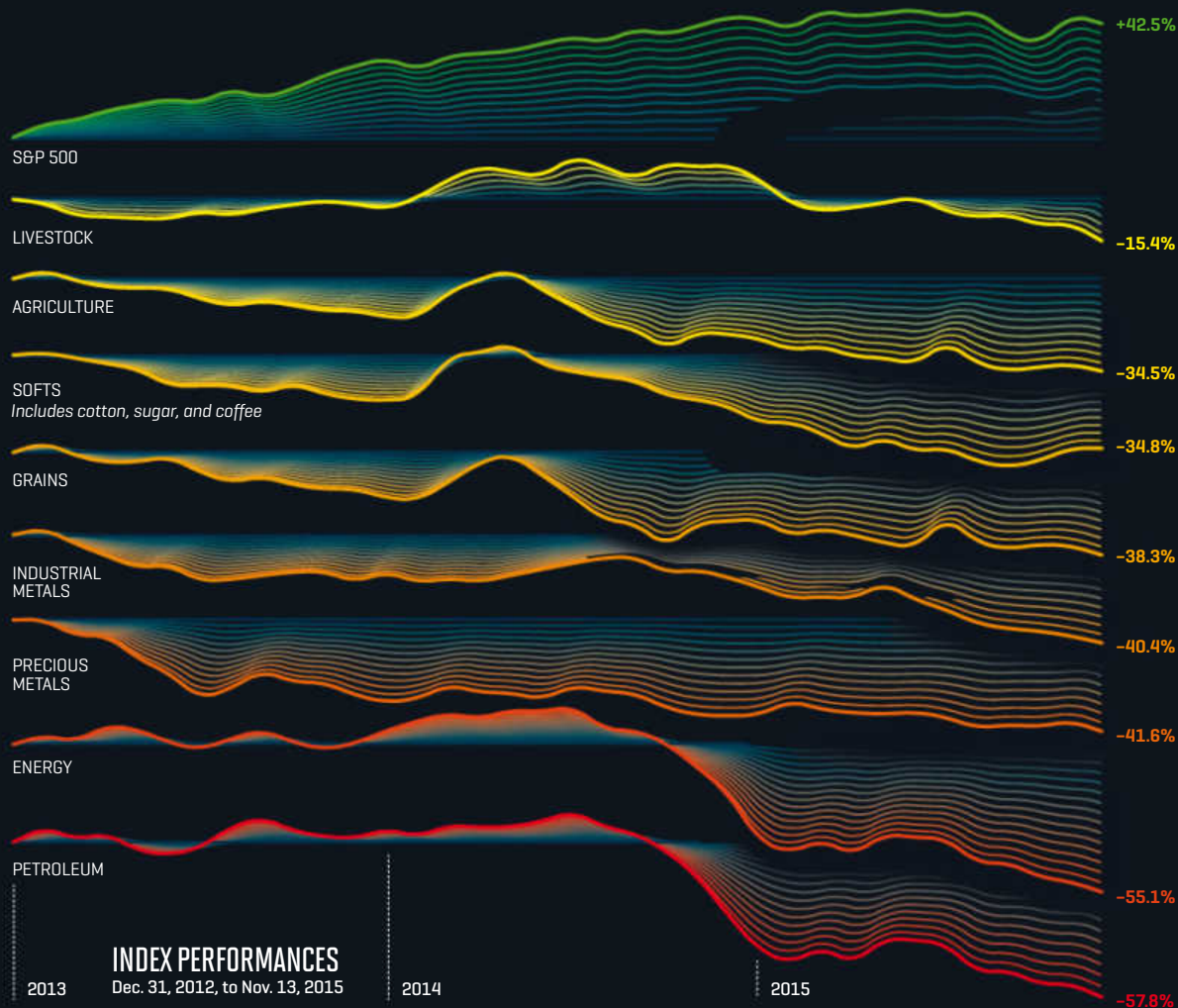
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## CHARTIST

DO THEIR  
FUTURES  
HAVE A  
FUTURE?

**AS INVESTORS NEAR THE END** of a volatile 2015, many asset classes still look expensive by historical standards. You can't say that about commodities, however: The prices of most have collapsed over the past three years. Still, low prices aren't necessarily a buy signal. Commodities generally don't rally until producers shut down money-losing mines and wells and farmers idle fields to bring supply and demand into balance. That isn't happening in energy. (Global oil supply is still rising as OPEC balks at slowing output.) And in metals, though some miners are cutting back, the slowdown in China and other emerging markets continues to dampen demand. Some bright spots? Shortages should boost coffee and cocoa prices in 2016, and brokers surveyed by Thomson Reuters Eikon expect modest rebounds for gold, silver, and copper. But until developing economies heat up again, the broader commodities outlook is dreary at best. —*Geoffrey Smith*

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## GIVING BACK

# Charity Cases

DONATING MONEY TO A GOOD CAUSE COULD SOON BE AS EASY AS HAILING AN UBER.

By Lee Clifford

**Y**OU CAN BUY a lawn mower, summon a car, or find a date with just a swipe, but to support a charity you often have to click through multiple screens, futz with cumbersome passwords, and type in credit card numbers (not to mention opt in or out of a lifetime of animal calendars and direct-mail solicitations).

According to a 2014 study by Dunham and Co. of 151 large charities, most make their donors click three to eight times to make a donation, and 84% of charity landing pages aren't optimized for mobile. Says Laura Arrillaga-Andreessen, founder

and chairman of the Stanford Center on Philanthropy and Civil Society: "The same principles that govern the success of Uber's app will need to be applied to increase online giving."

That's where startups such as L.A.-based Pledgeling come in. CEO James Citron says he wants anybody, anywhere, "to be able to see a story on TV or a billboard for Unicef and just take out your phone and give \$5." The Pledgeling app securely stores your payment information and connects givers to some 5,000 charities. (A nonprofit, Pledgeling makes its money from licensing its software—100% of donations after credit card fees go to the charities.) "I love Pledgeling," says Jarrett Barrios, CEO of the American Red Cross Los Angeles Region. "They allow us to capture people right in that philanthropic moment."

Google, too, is hoping to capture these "impulse givers." Its One Today app flashes users a beautiful photo and a new featured project each day, asking them to pledge \$1 and enabling them to "challenge" other users by matching their donations. Another new startup called HandUp lets anyone find and donate directly to local homeless men and women with just a few clicks. "There was a lot of friction in giving, and that's being stripped away," says Rob Solomon, CEO of

GoFundMe, which in the past year helped users raise a staggering \$1.09 billion from 16.1 million donors for personal causes.

With many of these new sites and apps, storytelling is the driver. HandUp donors can choose people to support after reading their stories and even send messages of encouragement. Pledgeling recently signed a deal with Evite to let party planners embed a donation request in lieu of gifts, often with a personal story. Suzanne DiBianca, president of Salesforce.org, cites a recent experience with the innovative nonprofit Pencils of Promise: "We funded a school in Laos, and we were getting progress reports on our phones," she marvels.

To that end Arrillaga-Andreessen thinks we'll see more "giving technology layered onto existing platforms like Snapchat, Instagram, WhatsApp, Facebook, and Facebook Messenger." After experimenting with charitable initiatives for years, Facebook in late November launched Fundraisers, which allows vetted nonprofits to collect money for specific campaigns with a "donate" button embedded on their posts so supporters won't have to leave the site to give.

In the end, hopefully, such technological boosts might even lead to a human one. "Giving in the U.S. has been stuck at 2% of GDP forever," observes Steve MacLaughlin, director of analytics at Blackbaud, a think tank for the nonprofit sector. If these technological leaps "lift that 2% or 3%, that's billions of extra dollars going to charities each year. I don't think anyone will care how it gets there." ■



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# THE BENEFIT OF BARING IT ALL

The latest revolution in the Information Age is making sure everybody has it. Here's why smart managers are opening the corporate kimono as never before. *By Geoff Colvin*

# R

**RADICAL TRANSPARENCY** ISN'T a new idea, but technology is making it a newly powerful one that successful 21st-century corporations will increasingly embrace. The basic notion—sharing all kinds of once-confidential information widely within the organization and sometimes even outside it—gives many managers hives. The new tech-turbocharged version will aggravate their condition. But in fact the advantages outweigh the risks.

Start with a simple example like Whole Foods Market's policy of letting everyone in the company know how much everyone else gets paid. How do you implement that policy with 91,000 employees? Only through sophisticated IT systems uniting HR with secure technology that lets insiders in and keeps outsiders out. The benefits,



says co-CEO John Mackey, are many: no more gossip speculation about other people's pay, greater justice in setting pay because managers know their decisions will be open to view, and better career self-guidance as employees see which positions make the most money.

Google doesn't disclose everyone's pay, but it lets every employee see the goals and objectives of every other employee, and every software engineer gets access to virtually all of the company's code on day one of employment. Traditional managers blanch at the very thought, but it seems to work. Some

people say Bridgewater hedge fund founder Ray Dalio is at least unbalanced because he insists that virtually all meetings and conversations involving the company's 1,500 employees be recorded and available online for any employee to hear. But Dalio says "being radically truthful and transparent" pays off in excellent performance, and it's hard to argue with his results: Knockout returns have made Bridgewater the world's largest hedge fund, with \$154 billion under management.

In a different realm, consider how Gen. Stanley

McChrystal transformed the Joint Special Operations Task Force in Iraq from 2003 to 2006. This counterterrorist force held a daily operations and intelligence briefing by teleconference with a few offices in the U.S. and at major bases in Iraq and Afghanistan. But it couldn't move nearly fast enough to match the insurgents. So McChrystal, among many other changes, invited far more people into the daily briefing. Eventually some 7,000 attendees were joining for almost two hours every day—a potential security nightmare. But with so many more players now connecting with one another and understanding their role in the overall strategy, the task force's raids increased from 10 a month to 300, and they became far more successful as commanders made better decisions faster.

Greater transparency can bring many advantages, and managers need to realize that it's happening whether they like it or not. Anonymous messaging apps like Memo and Blind encourage employees to share information free of employer control, and company-rating sites such as Glassdoor and Vault open corporate life to the world. In an environment like that, wise companies are playing offense, becoming the best source of some information for insiders (securely) and more information for outsiders. In the process they're becoming faster, smarter, more successful. It's a new, fundamentally different 21st-century way of operating that even nervous managers will eventually learn to love. **■**

# We're helping **Visa** launch connected commerce. So your car is now your card.

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# THE DISRUPTION FACTOR

HOW A FEW  
COMPANIES ARE  
CHANGING EVERYTHING  
THROUGH INNOVATION



**IN OCTOBER, THE U.S. NATIONAL ECONOMIC COUNCIL AND THE WHITE HOUSE OFFICE** of Science and Technology Policy (OSTP) released *A Strategy for American Innovation*, a 119-page report touting American ingenuity and how we can sustain it. "For an advanced economy such as the United States, innovation is a wellspring of economic growth," it reads. "While many countries can grow by adopting existing technologies and business practices, America must continually innovate, because our workers and firms are often operating at the technological frontier."

In other words, innovation isn't everything—it's the *only* thing. "We don't want to be competing on the basis of price and wages," says Tom Kalil, the OSTP deputy director for technology and innovation. "We want to be competing on the basis of generating new products and services that the rest of the world can't make yet."

Innovation is "the only answer for growth, it's the only answer for strategic renewal, it's the only answer for valuation, it's the only answer for getting top-quality people, it's the only answer for satisfying customers," says Rowan Gibson, who has written three books on the subject, including (with co-author Peter Skarzynski) *Innovation to the Core: A Blueprint for Transforming the Way Your Company Innovates*. "It's the only answer."

GE leadership recognizes that we're in a new era, as do the C-suites at IBM and

# KEYS TO SUCCESS

**Hilton Worldwide** is reimagining the future travel experience, and its Digital Key is just the beginning.



**G**ERALDINE CALPIN, HILTON WORLDWIDE'S global head of marketing & digital, remembers one of the first times she used the company's new Digital Key. She was composing emails at the desk in her room at the Hilton next to the company's headquarters in McLean, Va., earlier this year when there was a knock at the door. Instead of getting up to open it, Calpin just tapped the Hilton HHonors app on her phone and hit the "Unlock Door" button.

"The attendant delivering the room service opened the door and asked, 'How did you do that? Did you just use Digital Key?'" Calpin recalls. "I said, 'Yes, it's like a remote control for the door.'"

The Digital Key, which works through a Bluetooth technology that is proprietary to Hilton, is now available in about 50 hotels, with 10-20 hotels instituting the technology every week. By the middle of next year, it will be unlocking the doors to 170,000 rooms at 250 U.S. Hilton Worldwide properties, including Waldorf Astoria Hotels & Resorts, Conrad Hotels & Resorts, and Canopy by Hilton. Guests love it, as they do the company's new digital check-in with room selection feature on the HHonors app, which is loaded with the floor plans to more than 700,000 rooms. The app is also integrated with Uber so guests can receive ride reminders or use the Local Scene feature to explore top restaurants and



nightlife locations selected for their popularity with Uber riders.

"Travel can be stressful with too many decisions impacting the stay experience. Our app gives guests greater choice and control," Calpin says.

"Never before has a hotel guest been able to check in, select their room from a digital floor plan, request items to be ready upon arrival, and then access their room via their smartphone and find it exactly the way they requested it. We're reimagining the guest experience from the inside out, to give our guests the experience they deserve."

Digital Key is just the latest in Hilton's rich history of innovation since the company's first property opened nearly a century ago. Future develop-

ments could include using the app as a universal remote control, so guests could easily access their favorite channels and adjust beds to individual mattress preferences.

"People don't typically think of hotel companies as innovative," Calpin adds. "We have tried to change that rhetoric by doing new things, and doing them at scale. But it's got to be customer-driven. The vast majority of travelers pick their seat on an airline. If you want to pick your room, we're the only hotel company that lets you do it." ●

**Hilton**

Procter & Gamble, who are all about achieving growth through innovation. "Innovation is the central job of every leader across the company," adds Gibson. "What they're recognizing is that growth is driven by innovation. It's not going to come from cost cutting and downsizing, and all those other tired management practices."

But what is innovation, exactly? The White House report defines it as "an idea, embodied in a technology, product, or process, which is new and creates value. To be impactful, innovations must also be scalable, not merely one-off novelties."

Braden Kelley of [innovationexcellence.com](http://innovationexcellence.com), and the author of *Stoking Your Innovation Bonfire*, sees innovation as "transforming the useful seeds of invention into widely adopted solutions valued above every existing alternative." He goes on to make a couple of key distinctions: the first is the difference between invention and innovation. They're not the same thing. Innovation is not creativity. Another key distinction is between something that is merely useful and something that is truly valuable. "It has to be way better than everything else out there so that people are willing to go through the pain of replacing their existing solution," he says.

"WE WANT TO BE COMPETING ON THE BASIS OF GENERATING NEW PRODUCTS AND SERVICES THAT THE REST OF THE WORLD CAN'T MAKE YET."

—TOM KALIL, DEPUTY DIRECTOR  
FOR TECHNOLOGY AND INNOVATION  
AT THE WHITE HOUSE OFFICE OF  
SCIENCE AND TECHNOLOGY POLICY

Case in point: the effect the advent of iTunes had on the music business. It affected processes, service, systems, technology, marketing strategies, cost structure, management, and business models—even entire industry architecture. "The same thing has happened in recent years with Spotify and Netflix," notes Gibson. "It's kind of recalibrated the entire industry. These are all various forms of innovation, and a company really needs to be looking at every one of those areas in order to drive renewal across the business model."

To implement innovation, it must be embedded in the company fabric as a systemic capability, just like quality was 30 or 40 years ago. "Quality is embedded in leadership, management infrastructure, in processes and tools, the training of people, in the culture, the values. To really make innovation stick, we have to approach it in exactly the same way," says Gibson.

"There was a great ad from IBM that said, 'Stop selling what you have. Start selling what they need,'" he continues. "It's a whole process for making innovation systemic, so that the ideas that come out of that process have somewhere to go instead of falling into a black hole, which is what usually happens. You need to build that sustainable capability, so that you can take ideas all the way from the mind to the market."

Apple, of course, comes to mind, because of the company's seemingly unprecedented business-model innovation, which is much harder to replicate. Apple's iPhone is about the platform—the great product plus the app store—as is the case with the iPod and iTunes, introduced earlier.

"You can't live off one great product," says Gibson. "You need to continuously innovate and, in many cases, cannibalize your last great product, like the iPhone did to the iPod."

Tesla is another example of a company innovating across the entire business model. It's not just the product itself—it's the super-charger network that charges cars in minutes instead of hours, and the way owners can upgrade their car from normal to self-driving capability simply by downloading a software upgrade. With a market cap of \$25 billion, Tesla seems to have proven the value of this approach. The radical innovators are the

# COOKING UP Innovation

A focus on the consumer pushes **Tyson Foods, Inc.** to the top of the food chain



**A**T THE WORLD HEAD-QUARTERS OF TYSON FOODS INC. in Springdale, Ark., there is a 100,000-square-foot state-of-the-art facility known as the Tyson Discovery Center that includes 19 kitchens, a pilot plant, and a packaging innovation lab. The facility is home to about 175 R&D team members—from chefs to food safety experts—who cook up culinary innovations, explains Sally Grimes, Tyson's chief global growth officer and president, international.

**You're pretty serious about innovation at Tyson.** It really starts with cultivating a mindset for the team to see the world in new ways. And it's not just about product innovation. For us, innovation means doing something different that has impact. We spend a lot of time ensuring that we have a sense of curiosity and inquiry that permeates the chain and leads to a focus on solving consumer problems.

**How does Tyson define innovation?** It all starts with the changing needs of the consumer. For example, the definition of "wellness" has evolved considerably. In the past, wellness may have focused on weight manage-

ment—or what was "reduced" or eliminated from the food—like fat or sodium. Today, wellness also includes a focus on authenticity. It's about natural. It's about a cleaner label. It's about the reduction of antibiotics. It's about animal well-being.

**Talk a little about the latter.** We are committed to animal well-being. We have a program called the Tyson FarmCheck™ program, which involves third-party auditors who actually check the independent livestock and poultry farms that supply us, to make sure the animals have access to food and water, and that there's proper human interaction with the animals and worker training to ensure it occurs.

**Food safety is another hot topic.** Yes, particularly as we think about our global business. We just received the Black Pearl Award from the International Association for Food Protection. We continue to be focused on ensuring that our products stay fresh in the package, and are focused on packaging innovation.

**Most people associate Tyson with chicken, but with several other**



**brands, including Jimmy Dean, Hillshire, and Vans, you do a lot more than just poultry.** We do. We like to think of ourselves as a house of brands, rather than just a branded house, but it all comes back to the consumer. We start by defining what each of those brands stand for in the minds of our consumers. We are focused on the role they each play in the consumer's life. That takes Tyson Foods from a collection of products to a vast portfolio of benefits designed to meet consumer needs. ●



**Tyson Foods, Inc.**



84%

## OF GLOBAL EXECUTIVES BELIEVE THAT INNOVATION IS EXTREMELY IMPORTANT TO THEIR GROWTH STRATEGIES

"THE EIGHT ESSENTIALS OF INNOVATION,"  
DE JONG, MARSTON, AND ROTH.  
MCKINSEY QUARTERLY, APRIL 2015

companies creating all the new wealth these days.

As for traditional companies, notes Kelley, the key is to find the "intrepreneurs" within the organization, and help them develop the talents, skills, and abilities they need to move beyond an idea. The concept is a popular one currently as corporate leaders

try to establish a culture of nimble action in an environment that can often feel mired in bureaucracy and inefficient process. Intrepreneurs, on the other hand, are famously adept at developing ideas within the confines of an organization, using that organization's resources instead of credit cards or investor money.

"Startups are good at challenging the status quo, because they don't have the status quo as their main deliverer of revenue and their main source of revenue," Kelley says. However, about those blue-chip organizations, he continues to say that "existing companies have the resources and the infrastructure set up to scale something once they decide to do it."

Additionally, traditional companies typically have the benefit of large R&D departments. Think of AT&T Bell Laboratories (now Alcatel-Lucent Bell Labs), perhaps the most noteworthy example, which produced numerous foundational technologies including Unix, the transistor, the laser, and fiber optics, among many others. And where the R&D department ends, the government begins: The Strategy for American Innovation calls for a stronger commitment to publicly supported R&D, which has been the wellspring for so many innovations, such as the Internet, GPS, and the mapping of the human genome.

"Most companies no longer have the luxury to support investments in R&D that may not pay off for 10 or 20 years," says OSTP's Kalil. "That's why we think it's so important to have increased support for research and development, because the government can take a longer time horizon. Obviously, the entrepreneurs and companies have to do a huge amount of work to take these insights and turn them into products and services, but this very early-stage research that the government supports plays a foundational role."

Whether it's the government or the private sector, one thing is certain when it comes to innovation: Complacency is not an option. "Now is the time to increase American investment in innovation to drive economic growth and shared prosperity for decades to come," the OSTP report concludes. "Now is the time to support the efforts of the private sector to create the industries and jobs of the future that will underpin shared prosperity." ●

# SCIENCE OF THE senses

You might not know **International Flavors & Fragrances (IFF)** by name, but it's likely you've experienced its innovative products.



**F**UELED BY CURIOSITY AND DRIVEN BY A LEGACY OF PIONEERING FIRSTS, IFF is the company that teamed up with NASA to send a rose into orbit aboard Space Shuttle Discovery in 1998. They discovered that the fragrance in zero gravity possessed a cleaner, purer, more floral rose aroma that was, well, out of this world.

"We are in the business of discovery, of translating imagination into innovation and scientific invention into sensorial exhilaration," says Andreas Fibig, IFF's chairman and CEO. "We are always asking—and answering—what if?"

For more than 125 years, that innate curiosity has produced a plethora of firsts and thousands of patents. From introducing scent into bar soaps to the U.S. in the 1920s to creating sustainable alternative ingredients throughout its history, IFF embraces innovation. And they have long understood that the effect of a fragrance doesn't necessarily stop at the nose: Early explorations developed the field of aroma science, and mood-mapping technologies explore

our emotional response to the ethereal world of scent.

As consumers around the world focus on their health, IFF's ever-evolving FlavorFit™ technologies render foods and beverages as delicious and mouthwatering as their more indulgent counterparts. Looking to the future of foods, IFF scientists are exploring innovative protein sources to feed an increasingly hungry world.

But new generations demand innovations. It's not enough for clothes to smell fresh straight from the dryer, and IFF's encapsulation technology keeps that experience of freshness for a far longer time. And in an increasingly digital world, can digital scent be far behind? IFF recently announced a collaboration in this space, with a view towards personal scent experiences as close as your phone.

"In collaboration with our partners, we are always seeking what's next," says Fibig. "We're constantly pushing ourselves to create groundbreaking sensorial experiences, and leveraging a passionate team and powerhouse of R&D to deliver innovative firsts to our customers and the world."

Call it the sweet smell of success. ●


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DECEMBER 15, 2015

# Venture

HOW I GOT STARTED

## NO REST FOR THE MATTRESS FIRM

Co-founder STEVE FENDRICH took the plastic off the product and nurtured a chain that now has 2,400 stores.

*Interview by Dinah Eng*

**NOBODY KNOWS THE** value of a good night's sleep better than Steve Fendrich, 54. Partnering with two college friends, he opened a

*small mattress store in Houston in 1986, scraping out a living by transporting beds on the top of his car and heating Lean Cuisine frozen meals on its dashboard for lunch. That store grew into Mattress Firm, the largest specialty mattress retailer in the U.S., with more than 2,400 stores in 36 states after a recent acquisitions binge. The company estimates sales of \$2.4 billion in 2015 and profits of \$50 million. Fendrich's story:*

I didn't know there was such a thing as the mattress business when I graduated from college. I grew up in Sioux Falls, S.D., and got an accounting degree from the University of South Dakota, where I met Harry Roberts and Paul Stork, my future partners in Mattress Firm.

Harry had a brother-in-law, Jack Smith,



who owned the American Bed Co., a chain of mattress stores in Houston. The three of us went to work for him and learned the business.

It was the infancy of bedding specialty retail, and in 1983 I ran an American Bed store in Chicago. In 1985, I became comptroller of the company and moved to Houston. As I dug into the financials, I saw that capital needs were greater than the cash coming in.

Paul, Harry, and I decided we could do better. So in March 1986, I left, and Harry and Paul soon followed. American Bed filed for bankruptcy later that year.

We were all 25 and passionate about doing things our way. We each put in \$5,000, figuring we'd each get our own store eventually. Harry had his \$5,000, Paul borrowed from his mother, and I borrowed \$5,000 from my grandmother.

Back then, mattress stores were often in rundown areas with tile or concrete floors

and mattresses encased in plastic. We persuaded a shopping center to give us space and opened on July 4, 1986. We put in carpeting and took the plastic off the floor models so customers could lie down on the actual product. We sold Sealy, Serta, Spring Air, and Dreamline, and our most expensive bed was a queen for \$499.

We aimed to offer a higher level of service and a better delivery system. In Houston it took 12 days for delivery from a department store. With us, you could buy the mattress and get it the same day. When needed, I'd put a mattress on top of my car and follow the customer home.

We took a high-energy approach to selling a product that people hate to shop for. Each time we made a sale, we were so excited, one of us would call the other two and detail how the sale happened. As we expanded and managed different stores, it became, "This

“

**WE LEARNED THAT TO SELL \$1,000 BEDS, WE HAD TO HAVE \$2,000 BEDS SO PEOPLE COULD TELL WHAT BETTER BEDS FELT LIKE.”**

week my store's going to sell more than yours." It was fun and competitive.

We didn't pay ourselves for the first 14 to 15 months. The most important thing was to pay our vendors and our people. There was a time in late '86 when the brakes went out on Paul's car. He asked if the company could loan him \$400 to fix the brakes. We said no.

Paul lived a ways from the store, so he needed a car to get to work. I said, "I've got an American Express card you can charge it on. Hopefully, in 30 days we can pay it off." But we couldn't, and American Express said, "Cut up the card." I paid the bill off over time, but to this day, I don't have an AmEx card. It's in my wife's name.

Back then we lived on the cheap. We couldn't afford a refrigerator or microwave, and since we had to be in the store from 10 a.m. to 8 p.m., we couldn't go out for lunch. So we'd pick up Lean Cuisine frozen dinners that we'd leave on the dashboard of the car. By noon, the containers were so hot you couldn't touch them.

In late 1987 we gave ourselves our first paychecks of \$300 a week.

We always wanted to elevate our offerings, and in 1988, Stearns & Foster came to us, wanting a partnership. That changed

our price point to well over \$1,000, so it was a defining moment. By the late '90s close to 40% of our sales were Stearns & Foster, and we became a high-end store. We learned that to sell a lot of \$1,000 beds, we had to have \$2,000 beds in the stores so people could tell what better beds felt like.

We had failures along the way. For example, in 1990 we decided to sell living room furniture. But the merchandizing and fashion part of it was beyond our expertise. We later closed the furniture store and got back to what we do best.

We started to get offers for the business. In 1999 we had more than 250 stores and were doing \$300 million in annual sales. The three of us were in our thirties with young families when Malachi Financial made an offer. We thought long and hard and took it.

I became a consultant, then CEO of Sleep Country USA, which was later sold to Simmons Bedding. In 2008, Simmons promoted me to president and COO. Two years later we restructured the company and sold it.

I was out of a job, and the first person I called was Steve Stagner, Mattress Firm's new CEO. Steve wanted to accelerate growth and made me chief strategy officer. He wanted Paul and Harry back too, so now Paul runs our Mattress Pro chain, and Harry and his brother own close to 40 stores as franchisees. In 2011 we took Mattress Firm public.

I'm happy to be the founder and not at the helm. I work on mergers and acquisitions. I had a wonderful partnership with Paul and Harry. We created a lot of jobs. We've got great people taking care of our baby now, and I feel good about that. 

## BEST ADVICE

STEVE FENDRICH, co-founder of Mattress Firm

**ENGAGE PEOPLE** in the direction and strategy of the company, then give up control. You have to allow your people to lead, succeed, and fail so that they can learn from mistakes and move on.

**SURROUND YOURSELF** with people who balance your weaknesses. I was good at accounting and finance. Paul ran sales and operations. Harry did marketing. We were better together than as three individuals and embraced that.

**GET THE BRUTAL FACTS** from your sales staff. You need to know if you're selling the right product, if you have competitive pricing, and if advertising is working. So get intelligence from frontline people.



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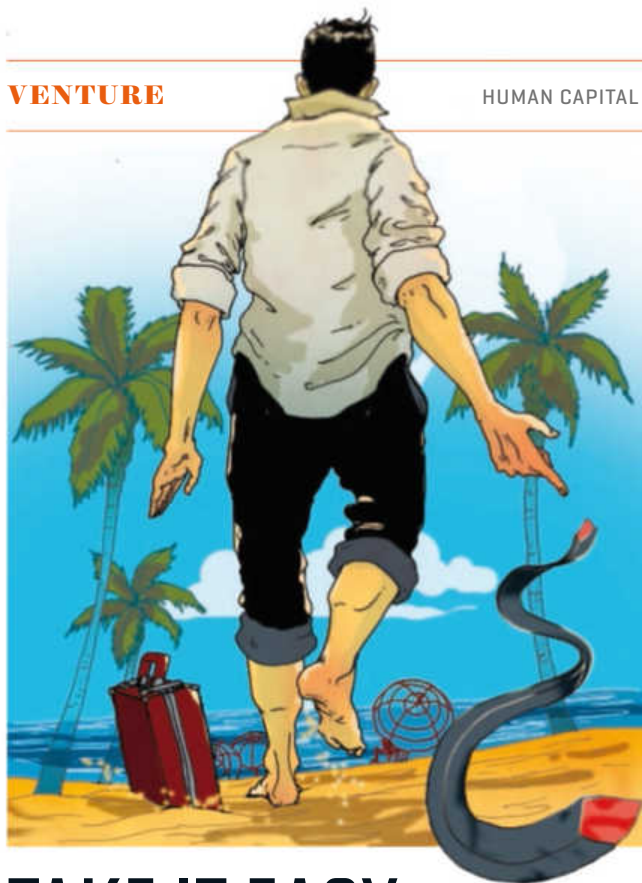
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# TAKE IT EASY. THAT'S AN ORDER!

Some CEOs are adopting a new approach in the quest for work-life balance.

By Jennifer Alsever

**M**OST EMPLOYERS PUSH new hires to start as soon as they can. Jason Freedman tells them to take a couple of weeks of vacation first. As CEO of 42Floors, an office-listing website, Freedman instructs his employees to take time off and stay balanced, despite the pressures of working at a startup. "They feel guilty taking vacation," he says. "I want people to know I'm serious. You need it."

Work-life balance is a perpetually hot topic, with 40% of full-time American workers logging more

than 50 work hours a week, according to a 2014 Gallup poll. People eat at their desks, check emails in bed, and, yes, forgo R&R. Some execs, most of them at young enterprises, are starting to push their workers to take time off—because it benefits not only the employee but also the employer.


Consider Bart Lorang, CEO of software company FullContact. Lorang requires his staff of 75 to take at least three weeks off per year. The company will even pay up to \$7,500 for the vacation—but only if the employees don't work while away. A photo hangs in the company's Denver office as a cautionary reminder. It shows Lorang with his fiancée riding camels in Egypt. But instead of gazing up at the pyramids, he was staring down at his smartphone.

FullContact's policy has paid off in more than happiness, says Eden Elder, its chief people officer. Productivity is up. Vacationers, she says, make up for the time off "right away because when they unplug and see the world, it pumps up the energy of everyone." (It also means an avalanche of job applications.)

Beyond vacations, Ryan

Sanders and Ben Peterson, co-founders of Utah-based software maker BambooHR, attempted to realign office habits with a "no workaholics" policy: Employees must leave at 5 p.m. and work no more than 40 hours a week. The two claim they almost fired one worker who regularly violated the rule. "We know this balance leads to much happier employees, and happy employees do great things," Peterson says. Indeed, BambooHR has landed accolades for being a top workplace in Utah.

Corey Blake takes a page from addiction treatment to deal with workaholics. The CEO and founder of Round Table Companies organizes interventions. The company has 36 employees who help co-author and produce books, videos, and articles for experts and executives. When the workload overwhelms somebody, three or four colleagues will call up and, Blake says, "lovingly confront" the employee, recommending help from a personal coach.

One such intervention three years ago left executive editor Katie Gutierrez in tears. But a few days later she realized they were right: She was editing six to seven books at once, and her performance was suffering. The painful conversation, she says, helped her change her habit of taking on too much and improved her relationship with Blake and other employees. "It felt like there was an urgency behind it and things had to change soon," she says. "We've all been there, and it's not healthy to be working that much—even if you love it." 

I'LL BE HOME  
SOON, HONEY,  
I PROMISE.

**\$224 billion:** how much U.S. businesses owe for unused vacation time.<sup>1</sup>

People who work **11-hour days or longer** are 67% more likely to develop heart disease than those who work seven or eight hours a day.<sup>2</sup>

Productivity takes a nosedive when people toil more than **55 hours a week.**<sup>3</sup>

1. ACCORDING TO A 2015 ANALYSIS BY OXFORD ECONOMICS, BASED ON SEC FILINGS FOR 114 COMPANIES COVERING 377,000 WORKERS;  
2. 2011 STUDY BY UNIVERSITY COLLEGE LONDON;  
3. 2014 STUDY BY JOHN PENCIVEL OF STANFORD UNIVERSITY



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# 5 Key Trends to Master in 2016

THE WAVES OF CHANGE ARE CONSTANT, BUT IF YOU RIDE THEM RIGHT, YOUR BUSINESS CAN PROFIT.

*By Verne Harnish*

## RETIRE THE TERM "MANAGER"

Zappos CEO Tony Hsieh took the radical step of eliminating all managers at his company. Now it's time to act on the fact that most people are better supervised by their phones than by their bosses. Flatten your organization in 2016 and shift your managers into the role of coach. A coach who works individually with 40 employees for one hour a week each will get far better results than most traditional managers overseeing eight to 10 employees.

VERNE HARNISH IS THE AUTHOR OF *SCALING UP*.



## EMBRACE "SCALE-UP" ECOSYSTEMS

With incubators abounding, support for startups is robust in most major cities around the world. But to really move the needle on jobs and innovation, more governments and private-sector institutions are pivoting into building ecosystems to support "scale-ups" to grow existing firms to \$1 billion in revenue. Now is the time to remind your local government leaders that the real economic engines of our economy need some attention.



## OPEN THE BOOKS ON HEALTH CARE COSTS

One-third of employers expect the greatest cost increase from Affordable Care Act compliance to take place in 2016, when companies with 50 to 99 employees must start providing insurance, a recent survey found. More are shifting to cheaper, high-deductible plans as a result. If you still invest in a comprehensive health plan, start educating your employees about exactly what this valuable form of compensation really costs your company—and what it's worth to them in pretax dollars. It will give you an edge over rivals who have pared such benefits.

## BENEFIT FROM THE FREELANCE ECONOMY

No matter how you feel about Uber, there's no denying that relationships between companies and talent have become more fluid. With nearly half the workforce expected to be freelance by 2020, now is the time to learn how to tap into this vital talent pool more effectively. Showing your leadership team how to organize and inspire free agents who don't necessarily depend on your firm for a paycheck every week will make your company more agile.



## BE LIKE A "B CORP"

Most growth companies will never be certified as a benefit corporation—a rigorous process that measures factors such as their environmental and social record. But with even the giant corporation Unilever publicly discussing becoming one, smart leaders should turn B Corp guidelines ([bcorporation.net](http://bcorporation.net)) into a checklist to drive their business in 2016 and beyond. Great employees want to work for companies that stand for more than just profit, so it will give you a leg up in the talent wars. And it's likely to win you more of the kind of customers you want to keep too.





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DECEMBER 15, 2015

# PASSIONS & *Perks*

SHOPPING



## ON VACATION AT THE MALL

Upscale designer outlets are travel destinations as shopping tourism spreads.

*By Geoffrey Smith*

**Bicester Village, an outlet mall with some 130 high-end shops, attracts 6 million visitors a year.**

**I**T'S A DRAB, cold, thoroughly English November morning, but it's not dampening the mood among the visitors to Bicester Village, a retail destination about an hour from London. Throngs of excited shoppers, many of them tourists from Asia, dart in and out of immaculately kept cottage-style shops in search of bargains from high-end designers like Prada, Alexander McQueen, and Saint Laurent. The U.K.'s only outlet mall, Bicester Village carries surplus luxury fashion, marked down by a third or more. But it tries very hard not to have the feel of a discount store. There are no untidy piles of clothes to rifle through; no group dressing rooms with

harsh lighting. Instead, the 130-odd stores aspire to the atmosphere of a Beverly Hills boutique, with plush seating; doting, multilingual sales staff; and valet parking.

Make no mistake: Bicester Village is not exactly exclusive—no destination with 6.3 million visitors a year could claim that—but it is clearly aiming for an upscale crowd, who scoop up Ugg boots knocked down to £110 (about \$170) from £190 (\$290).

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## PASSIONS & PERKS

of Chinese tourists have descended on Bicester Village in 2015 alone. The numbers seem certain to grow as a new rail link from London to Bicester Village—the first to connect the capital with another English city in more than 100 years—opened in October.

Bicester Village is riding a worldwide wave of “shopping tourism,” a by-product of the vast shift eastward and southward in global wealth in recent years. As affluence spreads across Asia and the Middle East, people are not only traveling more but also indulging the urge to splurge while on the road. The average non-EU shopper at Bicester and its sister malls spends about \$900 per visit, according to the village’s owner, Value Retail, a privately held company that operates nine such villages across Europe and one in China (a second outlet mall in China is coming next year).

Desirée Bollier, Value Retail’s chief executive, admits that the concept of shopping tourism is, at heart, only a refinement of an age-old phenomenon.

“Wherever people have gone,” she notes, “they’ve always had an urge to bring stuff back.”

Even the terrorist attacks that shook Paris in November won’t change that. “People still crave communal experiences,” she says. “This is a new reality that we all have to learn to live with.” Bollier points out that the 3,000 Chinese tourists



From top: A Bicester Village employee is on hand to assist visitors; a couple stop for refreshments; shoppers wait for the new rail link to London.

who were due that week at Value Retail’s village outside Paris were offered the option to cancel; few did.

Certainly the figures seem to back up her optimism. The United Nations World Tourism Organization (UNWTO) estimates that the number of people traveling internationally more than doubled in the past 20 years, to 1.13 billion in 2014. A big motivator for all that travel has been shopping tourism. For Value Retail, that has been reflected in annual sales growth of more than 10% for the past 39 straight quarters. That’s a remarkable achievement considering it is essentially an old-economy business (brick-and-mortar retail) operating in a low-growth environment such as

post-crisis Europe. The mix—two parts high-end international brands like Gucci to one part up-and-coming local names like Anya Hindmarch—ensures that the experience is what Bollier calls “a voyage of discovery” for tourists.

As with much else with regard to the luxury sector, it’s the behavior of the Chinese customer that is the key variable. Even the most modest assumptions about the growth in outbound Chinese tourism over the next years are head-spinning: Fewer than 10% of Chinese currently have a passport, according to most estimates, and the number of outbound Chinese visitors is expected to double from 2013 to 2020, to 200 million.

Chinese tourists are already the world’s biggest spenders, according to the UNWTO, dropping \$165 billion on their travels in 2014, 50% more than Americans, a distant second. No wonder the U.S., the U.K., France, Germany, Italy, Canada, and Thailand have all eased visa requirements for Chinese tourists in the past two years.

For Value Retail and competitors like McArthurGlen and Simon Property Group, the key is to follow the tourists: VR’s La Vallée Village in France is right next to Disneyland Paris, and it will repeat the trick next year when it opens next to Disney’s new resort in Shanghai. In the same vein, McArthurGlen broke ground last month on a 120-store designer outlet mall in Provence, a region that hosts 30 million tourists a year.

It may seem paradoxical that upscale outlet malls like Bicester and La Vallée are thriving on Chinese demand at a time when one luxury company after another is blaming the slowdown in China for bad quarterly figures. But the contradiction is only superficial. President Xi Jinping’s anticorruption campaign may have hit conspicuous consumption at the very top end of the social pyramid, but it isn’t stopping the rising, spreading wealth of a middle class eager to snap up luxuries at a discount. It’s these shoppers, along with ample numbers from the Middle East, and, yes, America, who are driving the success of places like Bicester Village. The middle class may not spend quite so freely as the super-rich, but when it comes to making money, there’s still no substitute for volume. ■

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# PURCHASING PRECIOUS METALS

AS METAL PRICES HAVE FALLEN, SALES OF BARS AND COINS HAVE CLIMBED. HERE'S WHY YOU MIGHT WANT TO BUY IN TOO.

## GOLD HAS FALLEN BY ABOUT 12%

over the last six months, and the dip has been a boon for coin and bar dealers. According to the World Gold Council, in the third quarter of this year, gold coin sales reached 2008 levels as demand for the yellow metal climbed 8% year over year.

The reason for the uptick is connected to falling gold prices, says John Mulligan, head of member and investor relations at the World Gold Council. "It's often a question of timing."

## Seeking Secure Coins

One of the big beneficiaries of this increased demand has been the Royal Canadian Mint, which produces all of the country's circulation coins and manufactures circulation coins for other nations. Sales of its Gold Maple Leaf and Silver Maple Leaf bullion investment coins have climbed year-over-year—by 28% and 17% respectively.

Holders of the mint's coins tend to like that the weight and purity are guaranteed, and that the .9999 purity rating is higher than that of many other mints' coins and bars.

"It's also a very liquid product offering; our Maple Leaf coins are sold and bought back by leading bullion dealers and banks around the world," says Chris Carkner, executive managing director of the Royal Canadian Mint's Bullion and Numis-

metics divisions.

"Our bullion coins have unique visible security features such as radial lines and micro-engravings created by laser technology," says Carkner. "These are very important to buyers who want to ensure they're getting an authentic coin."

As an added security feature, starting in early 2016 authorized dealers will have access to the mint's proprietary Bullion Digital Non-destructive Activation (DNA) anti-counterfeiting technology. Bullion DNA uses a compact, cube-shaped reader to match the laser marks on the mint's bullion coins with encrypted images stored in a secure database—facilitating authentication in seconds and delivering peace of mind to the bullion investment market.

## Potentially Rising Prices

Prices have fallen for certain metals, including palladium and platinum, which have dropped by about 33% and 24%, respectively, over the last six months. However, fortunes could change in 2016, says George Gero, director of the International Precious Metals Institute's® Metro New York Chapter.

Gold and silver prices usually climb with inflation, and that hasn't happened for a while, Gero says. However, since the Federal Reserve is targeting a 2% inflation rate, he thinks inflation will rise with interest rates, either in December or early next year.

Palladium and platinum prices could stay lower for longer, as the slowing Chinese economy is affecting demand. However, the supply picture can change quickly, says Gero. Palladium, specifically, is mined in South Africa, where labor problems have been rampant. "Supply is tenuous because it comes from countries where it can be curtailed," he says. In other words, the price for these metals could rise faster than expected.

If you take the long-term view of the market, though, now is a good time to invest in gold, says Mulligan. ●





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# Tech

LOCATION OF INTEREST

## TALLINN, ESTONIA

The Baltic city known for its key role in the birth of Skype remains a hotbed for tech entrepreneurs.

*By Richard Morgan*

Baltic Sea

TALLINN

1 MILE

### THE GUIDE

1

#### TRANSFERWISE

**Veerenni 24**

The “unicorn” peer-to-peer payments service keeps its largest office (300 people) here.

2

#### GUARDTIME

**A.H. Tammsaare tee 60**

The block-chain security company houses its R&D in Tallinn and counts Ericsson and Lockheed Martin among its clients.

3

#### NATO CYBER DEFENCE CENTRE

**Filtri tee 12**

The global military organization aims to improve information-sharing practices among NATO nations.

4

#### SKYPE

**Akadeemia tee 15b**

The videochat company, now owned by Microsoft, is a point of national pride. Nearly half its staff is still in Tallinn.

5

#### STARSHIP TECHNOLOGIES

**Teaduspargi 8**

A new venture by some Skype co-founders plans to launch next year a fleet of six-wheeled package-delivery robots in London.

6

#### 3DPRINTEROS

**Raja 15**

The “world’s first cloud operating system for 3D printers” is backed by Paul Allen’s Vulcan Capital and sells to Cisco.

#### TICKER TAPE

*A collection of curiosities*

**43%** SHARE OF WORLD’S BIGGEST BANKS THAT HAVE ZERO BOARD MEMBERS WITH TECH EXPERIENCE

SOURCE: ACCENTURE

**30%** SHARE THAT HAVE ONE BOARD MEMBER

# WHY EVERYBODY NEEDS A CONNECTED DOORBELL

A look at this year's hottest product category, with models from SkyBell, Ring, Vivint, and August.

By Stacey Higginbotham

**G**ET READY TO RING in the New Year with a connected doorbell. Yes, really. These Wi-Fi-enabled gadgets replace your conventional doorbell with a device that, in most cases, links to your mechanical door chime and syncs with an application on your smartphone. When a visitor rings the doorbell, a notification appears on your phone's screen. Tap on it to launch the application, from which you can view a video stream of the person at the door. It's no parlor trick. With such a system you can start talking to your mailman, neighbor, or even would-be robber and convince them that you are home when you aren't. Once you have a connected doorbell, you may find yourself using it for far more than its advertised purpose (I use it to see if the items my daughter wears to school and "loses" actually make it home). For \$200, a smart doorbell gives a little peace of mind and a lot of high-tech ability to track holiday gifts when they're in the so-called last mile. Here's a look at four options available today.



**OUR PICK!**  
BEST DOORBELL

## AUGUST

This \$199 model comes in four colors and has the most striking design of the bunch. It takes about three seconds on Wi-Fi to start a videochat, which works well thanks to an especially tall viewing angle. The doorbell works with the August smart lock to enable you to see who's at the door, then let your visitor inside. Installation takes 15 to 30 minutes, depending on the mounting surface.

## SKYBELL

The \$199 Skybell HD offers features you won't find on competing models—among them, full-color night vision, customizable LEDs, and an embedded temperature sensor for eventual use with other smart devices. But the "silence" option on the door chime is a feature that new parents will love, allowing them to receive phone notifications without waking the baby.



## RING

Earlier this year, Richard Branson backed the company that makes the Ring doorbell. Better still, American Family Insurance customers can receive a 5% discount on monthly premiums because video doorbells reduce burglaries. At \$199, Ring is the only model on this list that can use a battery. But it doesn't connect to your existing chime, and its videochat is sluggish.



## VIVINT

This model looks the most like a conventional doorbell. It's anything but. Vivint's doorbell comes with a contract for its home security service. The upside? Someone else will install it for you. The downside: \$54 a month for service. The doorbell ties into a network of sensors that Vivint will set up, so if you want security and home automation, this is the bell for you.



DOORBELLS: COURTESY OF AUGUST, SKYBELL, RING, AND VIVINT; RAD: GABRIEL OJSEN—FILMMAGIC/GETTY IMAGES



**"Like, no."**  
LONDON EVENING STANDARD

During an interview ahead of parent Match Group's Nov. 19 IPO, how Tinder CEO Sean Rad described his response to a "supermodel... really famous" who was "begging" him for sex

## Effortless Operation

Let the power of robotic technology handle the ground floor.

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# 5 Productivity Tools for Multitaskers

THESE TECH PICKS FROM AMAZON SIMPLIFY ROUTINE TASKS SO YOU HAVE MORE TIME AND LESS TO DO.

Effective leaders aren't expected to do everything single-handedly. Executive assistants, optimization processes, automated systems, synced devices and more work together to reduce unnecessary wasted time and the effort it takes to run both small and large businesses. Take these lessons home with tools and technologies that streamline your daily duties—from cleaning and eating to other essential to-do's—and free you up to dedicate your mental energy to what matters most.

## Health Monitoring

Tap into technology to improve your personal hygiene for a smarter approach to maintaining good health.



### ORAL-B 7000 SMARTSERIES ELECTRIC TOOTHBRUSH WITH BLUETOOTH POWERED BY BRAUN

The first of its kind, this Bluetooth brush allows for real-time feedback on brushing habits by syncing with your smartphone to signal changes in pressure.



## Remote Controlling

Manage all of your in-home tech products from afar at the push of a button or the sound of your voice.

### WEMO SWITCH

Control your electronics from any location through Wi-Fi with your smartphone or the Amazon Echo.

## Prototype Design

Expedite the building process. Start creating tangible models within minutes of conception and design.

### DREMEL IDEA BUILDER 3D PRINTER

The power is in your hands to develop prototypes or personalized items on the spot.



# Ask Questions, Get Answers



"Give me the daily news briefing."

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**amazon echo**

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# ANY GAME YOU'D LIKE, SO LONG AS IT'S ON STEAM

VALVE changed how people purchased computer games. Now it wants to enter the living room.

By John Gaudiosi



## THE STEAM CONTROLLER

The \$50 wireless accessory embodies Valve's strategy to extend its appeal to the living room. Every button and pad can be programmed to accommodate PC and console games alike—"thousands," Valve says.

# S

INCE ITS FOUNDING in 1996, Valve Corp., the videogame developer responsible for *Half-Life*, *Counter-Strike*, and *Dota*, has worked to stay under the radar.

But it's hard to ignore the fact that Steam, its digital distribution platform, fundamentally changed

the industry. In an era of boxed software, Steam allowed gamers to download titles over the Internet. Today, Steam has an estimated 150 million active accounts. They translate to predicted 2015 earnings of \$1.7 billion—two-thirds of which are generated by third-party developers using Steam.

But competition has grown fierce in the \$68.2 billion digital games industry. Console-game makers like Sony, Microsoft, and Nintendo have embraced digital distribution too, leaving Valve with just a sliver of global market share.

Enter Steam Machines. The Bellevue, Wash., company partnered with 13 PC makers to sell customizable computers priced between \$450



From top: *Counter-Strike*, *Half-Life*, and *Team Fortress*. All three popular Valve franchises will be available for the 2016 launch of Steam Machines.

and \$1,500 and designed to compete with consoles like Xbox One and PlayStation 4. Valve's hope is that it can broaden its appeal with a single box.

The pressure is on. Mega-publisher Electronic Arts has launched its own digital distribution platform called Origin. Meanwhile, Sony and Microsoft have embraced cloud-based gaming with PlayStation Now and Xbox Live. Will game publishers opt to leave Steam and choose to distribute their own wares?

Valve isn't worried. "Why are we seeing this growth?" asked co-founder Gabe Newell at an industry event in 2014. "Because we're all benefiting from the competition with each other." 



**"EXPECT NUMEROUS CYBERATTACKS. WAR IS DECLARED."**

YOUTUBE

The response of hacking collective Anonymous to ISIS, which claimed responsibility for the November attacks in Paris



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# CTRL+3DP

HP INC. stakes its future on 3D printing with speedy systems that could cut manufacturing costs and undercut the competition. *By Andrew Zaleski*

**I**T HAS BEEN a busy year for Hewlett-Packard. What was once a single, storied Silicon Valley computing company is, as of November, now two: Hewlett-Packard Enterprise, which sells gear and services for data centers and commercial computing, and HP Inc., which sells printers and personal computers.

There has been much focus on the future of HP Enterprise, led by Meg Whitman and considered the more ambitious of the pair. But big bets are happening at Dion Weisler-led HP Inc. One of them is on a historic Hewlett-Packard strength: printing. Only this time, it's in three dimensions.

Additive manufacturing, commonly known as 3D printing, is the process by which objects are assembled layer by layer out of plastic, resin, or powdered metal. It's a fast-growing industry that has the potential to upend the manufacturing

process by shortening the product-development life cycle and cutting costs on the assembly line. *Fortune* 500 companies like Ford and General Electric have invested millions of dollars in their own 3D-printing divisions for these reasons.


But today's large 3D printers are slow, expensive, and difficult to use. "We have been trying to understand how we can move beyond prototyping," says Ellen Lee, leader of Ford's additive manufacturing research team. "One of the big challenges that remains is speed."

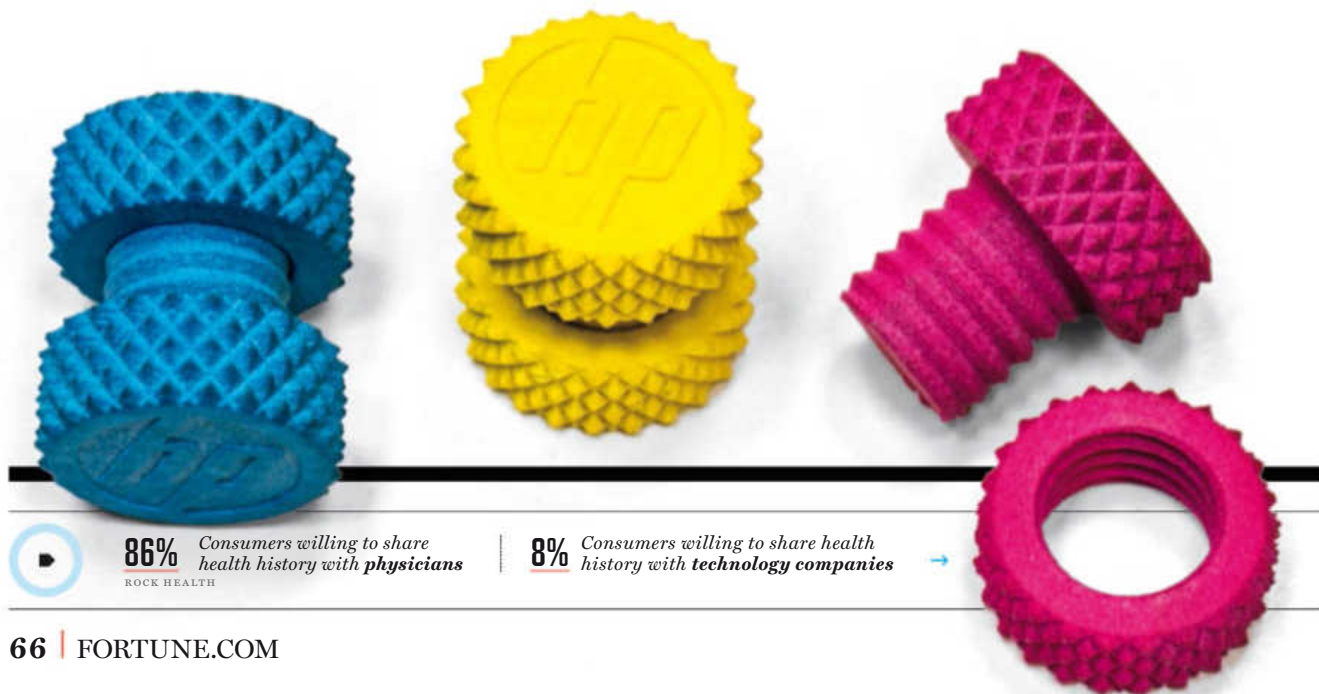
Enter HP 3D Printing. The new division plans to launch a line of 3D printers in 2016 that promises to top competing machines from market leaders like Stratasys and 3D Systems. "All of the excitement about the market is real," says Stephen Nigro, president of HP 3D Printing. "But there are a lot of problems to overcome."

HP's 3D printers use what

the company calls a Multi Jet Fusion process. The technology uses a thermal inkjet array and chemical agents to produce what it says are more reliable and precise parts. Objects can be made from a variety of materials in an array of colors and, crucially, at speeds 10 times faster than what's available from today's commercial 3D printers.

The opportunity is huge. The global market for 3D-printing products and services will grow from \$5.5 billion this year to \$21.2 billion in 2020, predicts the *Wohlers Report*. But first HP must stop bleeding: Fourth-quarter printing revenue fell 14%, and its 2016 earnings forecast, at \$1.59 to \$1.69 per share, missed estimates.

It's an uphill climb. But Nigro, who started at HP in 1982 as part of the team that developed the first color inkjet printer, is optimistic: "We plan to be the leader in 3D printing." 

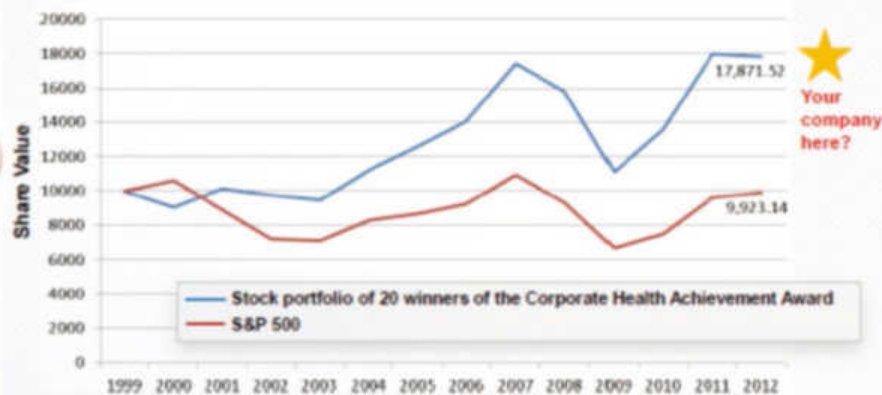


**86%** Consumers willing to share health history with *physicians*  
ROCK HEALTH

**8%** Consumers willing to share health history with *technology companies*



# COMPANIES WITH A CULTURE OF HEALTH OUTPERFORM THE MARKET.



Source: JOEM, "The link between workforce health and safety and the health of the bottom line," Fabius et. al, Sept 2013.

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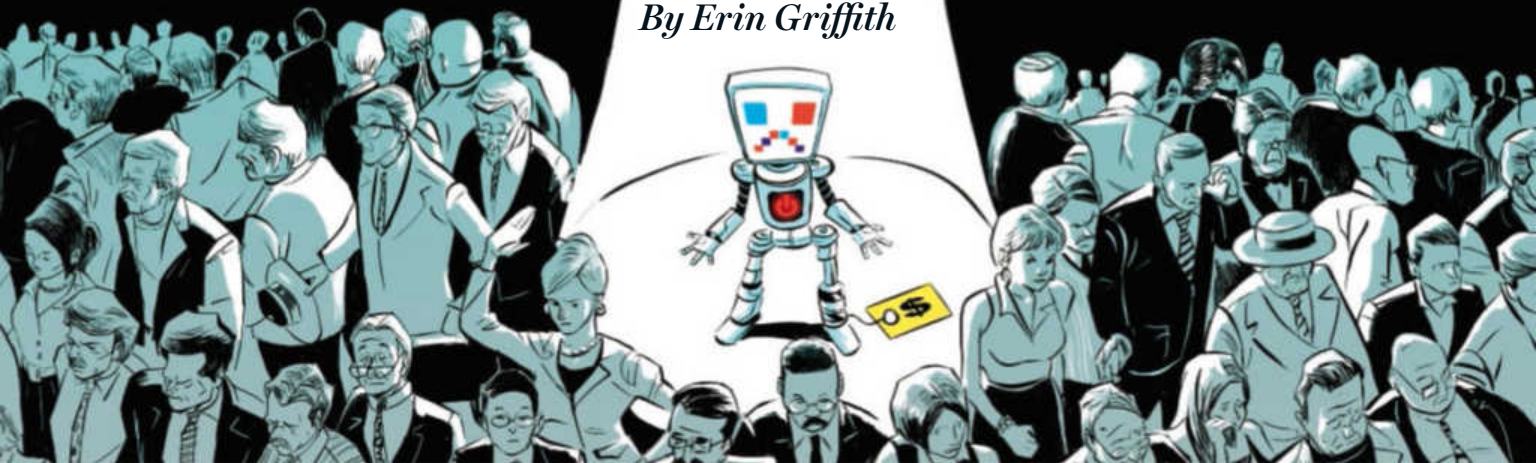


**EHE INTERNATIONAL**

# SNAP. CRACKLE. (POP?)

How to interpret the sudden unraveling of private tech company valuations.

By Erin Griffith



**A** YEAR AGO, INVESTORS CLAMORED to get a piece of hot tech startups like Zenefits and Snapchat. This magazine even argued that it was unfair that regular investors couldn't access the world's fastest-growing private companies.

Today those investors are probably happy they never had the chance. Each day there's a new report casting gloom on Silicon Valley's herd of magical billion-dollar "unicorn" startups: missed targets at Zenefits, share markdowns at Snapchat, a cash crunch at Jet, an executive exodus at Rent the Runway. Dropbox faces doubts about its revenue potential. Theranos is losing business deals. And don't forget WeWork's highly risky real estate deals, and unrealized revenue projections at Lyft. Flipboard failed to find a buyer. Square priced its IPO underwater. Zirtual and Homejoy—not unicorns, but highly valued and highly funded all the same—abruptly shut down.

Each new report is shocking because we receive little information on the health of these private companies—we know only what they choose to share. Usually those are impressive-sounding figures like “400% revenue growth” (from what base? \$1?) or a robust “revenue run rate,” a decidedly non-GAAP measurement. Worse are the totally meaningless, hard-to-contextualize

stats: Startup X has reached 5 billion “impressions” per month! (But what about profits? Does this revolutionary business model actually work? *No comment.*)

I understand why startups prefer to focus on growth rather than succumb to the quarterly pressures of Wall Street. But these companies are not tiny fly-by-night upstarts. They employ hundreds (in some cases, thousands) of people and have raised hundreds of millions of dollars in funding. The stakes are high.

In the first tech bubble, at least we knew how much money the startups were burning. Today's information scarcity means each new shred of bad news makes us rightly wonder which other startups are hiding dysfunction. Meanwhile, the blogging, tweeting commentariat relishes the sordid wreckage of it all. They've been calling for this tech bubble to pop every month since Facebook went public. Finally—maybe!—this time it's really here. Call it *schaden-funding*.

Whether recent startup revelations paint an accurate picture of the health of these businesses is beside the point. For investors, narrative is king. It's hard to drum up excitement when so many of Silicon Valley's rocket ships now look like battered question marks. When that happens, startup CEOs lose the benefit of the doubt. Top employees leave. Competitors move in. Momentum halts. And investors look elsewhere for growth.

Staying private for as long as possible was the startup world's way of controlling the narrative. That plan is crumbling, leaving young tech companies to grapple with a concept made popular by futurists in their own community: “Information wants to be free.” Sounds great—unless you're on the other side of it. **f**



**\$18.7 BILLION**

CB INSIGHTS

Total Chinese venture capital investment from Q1 to Q3 2015 →

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**Lufthansa**

# DEFYING GRAVITY

A new class of space startups is vying for a spot on the launchpad—and succeeding. *By Clay Dillow*

**W**HEN CONGRESS restricted the import of Russian RD-180 rocket engines following Russia's annexation of Crimea last year, United Launch Alliance found itself in a bind. ULA, a joint venture between Boeing and Lockheed Martin, now had a dwindling supply of cores to power its Atlas V rocket. Without it, the U.S. Air Force would have no way to launch the Pentagon's most sensitive satellites.

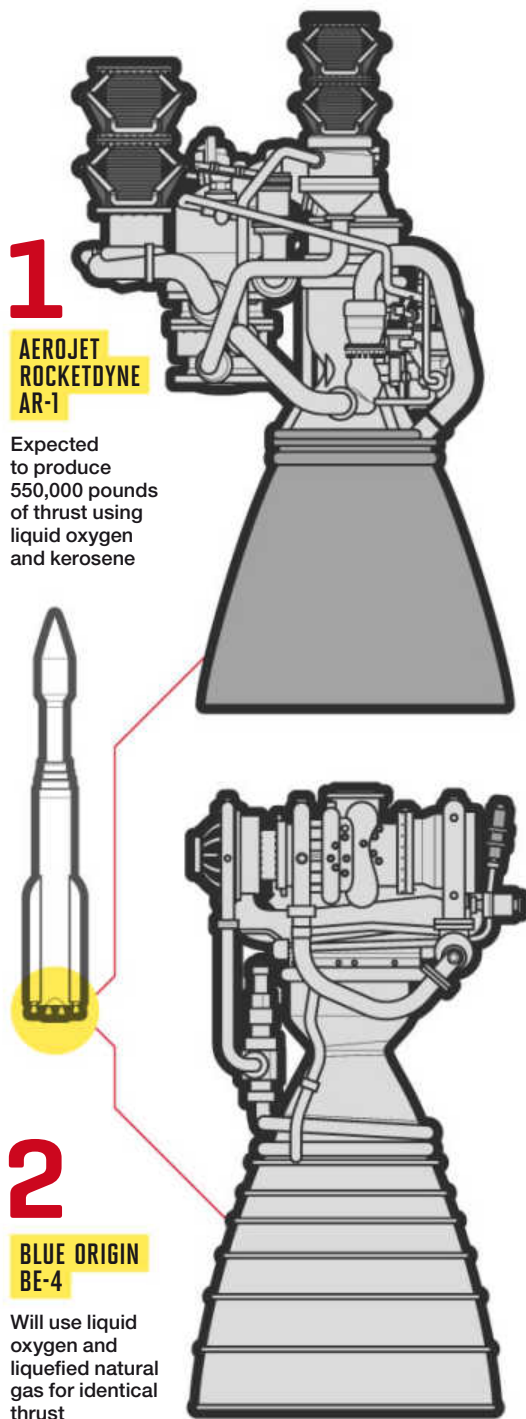
So ULA and the Air Force went looking for an American replacement. Aerojet Rocketdyne, a venerable propulsion expert that played a key role in the 1950s space race, proposed to build ULA a new rocket engine, the AR-1. But the Alliance instead chose Blue Origin, a space company that until Nov. 23 hadn't launched anything into space.

In late 2014 ULA and Blue Origin agreed to co-develop the Blue Engine 4 (BE-4) to replace the RD-180, declaring Aerojet's AR-1 a backup. Cost played a decisive role: Developing the AR-1 would require \$1 billion, much of it from taxpayers, while the BE-4 is privately funded by Blue Origin.

It's also about optics. "Newspace" companies like Blue Origin, which was founded in 2000 by Amazon CEO Jeff Bezos, and SpaceX, founded in 2002 by Tesla Motors CEO Elon Musk, are supplanting legacy aerospace behemoths in the commercial space business. Coupling itself with Blue Origin is one way for ULA to gain entrée to the cool kids' table.

The decision could push Aerojet Rocketdyne to the fringes of a market it helped create. The company is still developing the AR-1 at its own expense, and vice president Julie Van Kleeck says Aerojet is confident that the AR-1 will power ULA's next-gen rockets. This is rocket science, after all. Blue Origin still has to produce a product that works.

"The competition forces us all to push the envelope," Van Kleeck says. "But building rocket engines is a very unforgiving business."



WHITMAN: DAVE KOTINSKY—GETTY IMAGES



**"This is not good."**

EV STRATEGIC GROWTH FORUM

HPE CEO MEG WHITMAN'S HUSBAND UPON SEEING HER WATCHING AFTERNOON TV FOLLOWING HER 2010 LOSS IN THE CALIFORNIA GUBERNATORIAL ELECTION



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# SHOP TILL YOU...

As foot traffic falls at older shopping malls, **WESTFIELD** looks to software to ease the pain and upgrade the experience. *By Phil Wahba*



**T**HIS PLACE HAS GOT EVERYTHING," muses Joliet "Jake" Blues as he and his Blues Brother, Elwood, barrel through a shopping mall (with police in hot pursuit) in the classic 1980 film. Mall operators wish more of today's consumers felt that way. But painful parking lots and aging amenities have only helped accelerate the shift toward online shopping.

Westfield, an Australian company that owns about

40 shopping centers and malls in the U.S., has developed a mobile application that tells you if parking spots are available and where. It's just one of several technologies that the operator is testing in London and Australia, with a view toward an eventual rollout in the U.S., where the company operates upscale properties, such as Westfield

Century City in Los Angeles and Valley Fair in San Jose.

An app might seem like a minor improvement to some. But it illustrates the effort that mall developers like Westfield, Simon Property Group, and General Growth Properties are making to stay relevant at a time when foot traffic in older malls is declining. Brick-and-mortar sales in the U.S. dropped 8% in November and December 2014 vs. the year prior, according to RetailNext. It expects a similar decline in 2015.

"We're very passionate about parking lots," says Kevin McKenzie, Westfield's chief digital officer. "We do nothing but think about solving friction the consumer has with getting in and out of our shopping centers and transacting with our retail partners."

The app is the work of Westfield Labs, an in-house incubator the company launched in Silicon Valley in 2012. The team of 70 is also testing license-plate-scanning technology for ticketed parking and what it calls a "searchable mall," which allows a customer to look for an item in all stores in a shopping center.

Westfield is agnostic to how its tenants' customers shop, so long as they do.

"We're a marketplace," McKenzie says. "We're in the business of driving transactions, offline or online." **TS**

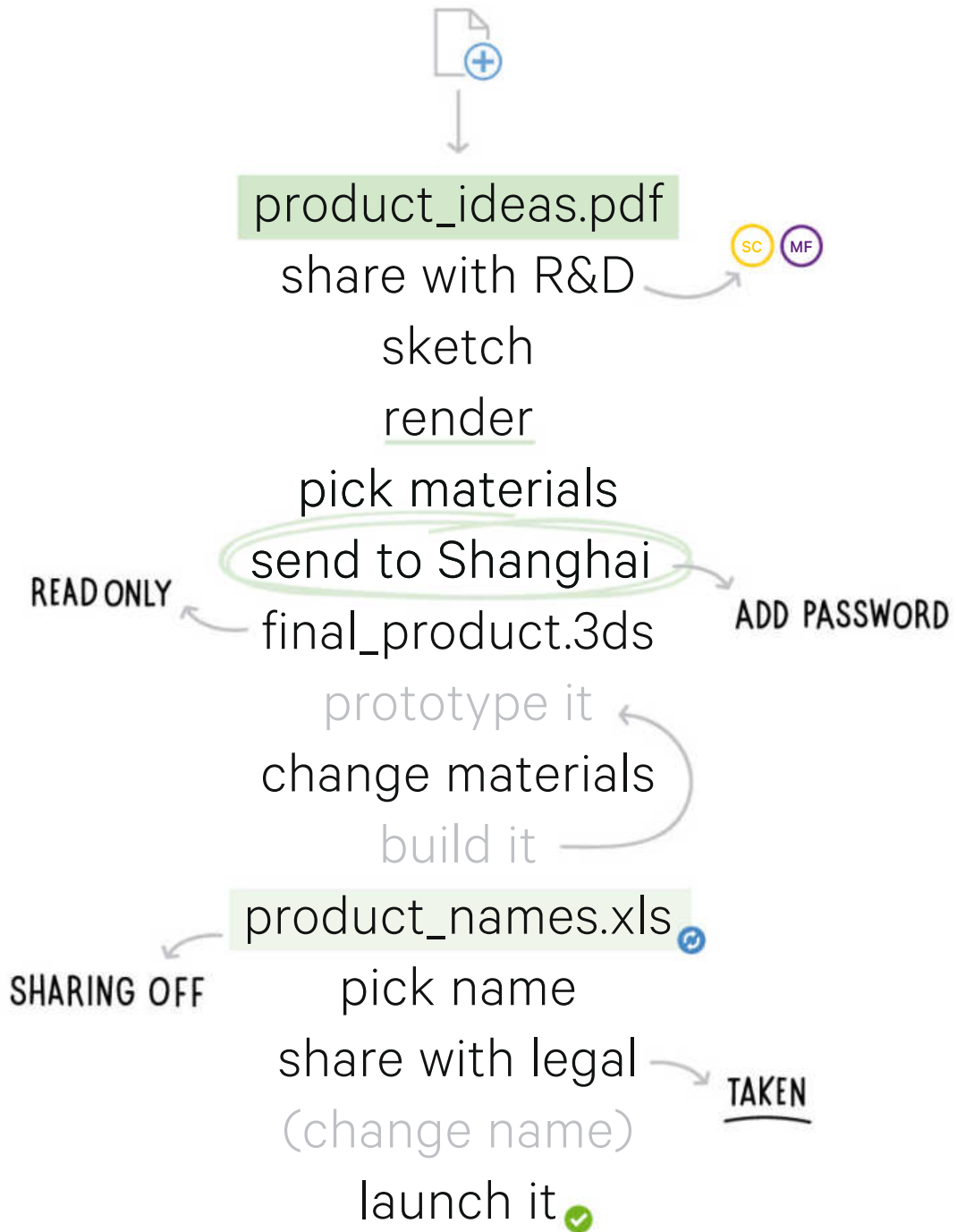


Brainstorming at Westfield Labs in San Francisco's SoMa neighborhood



**OF 35% OF ONLINE SHOPPERS WHO CHOSE IN-STORE PICKUP, 50% HAD ISSUES GETTING GOODS**

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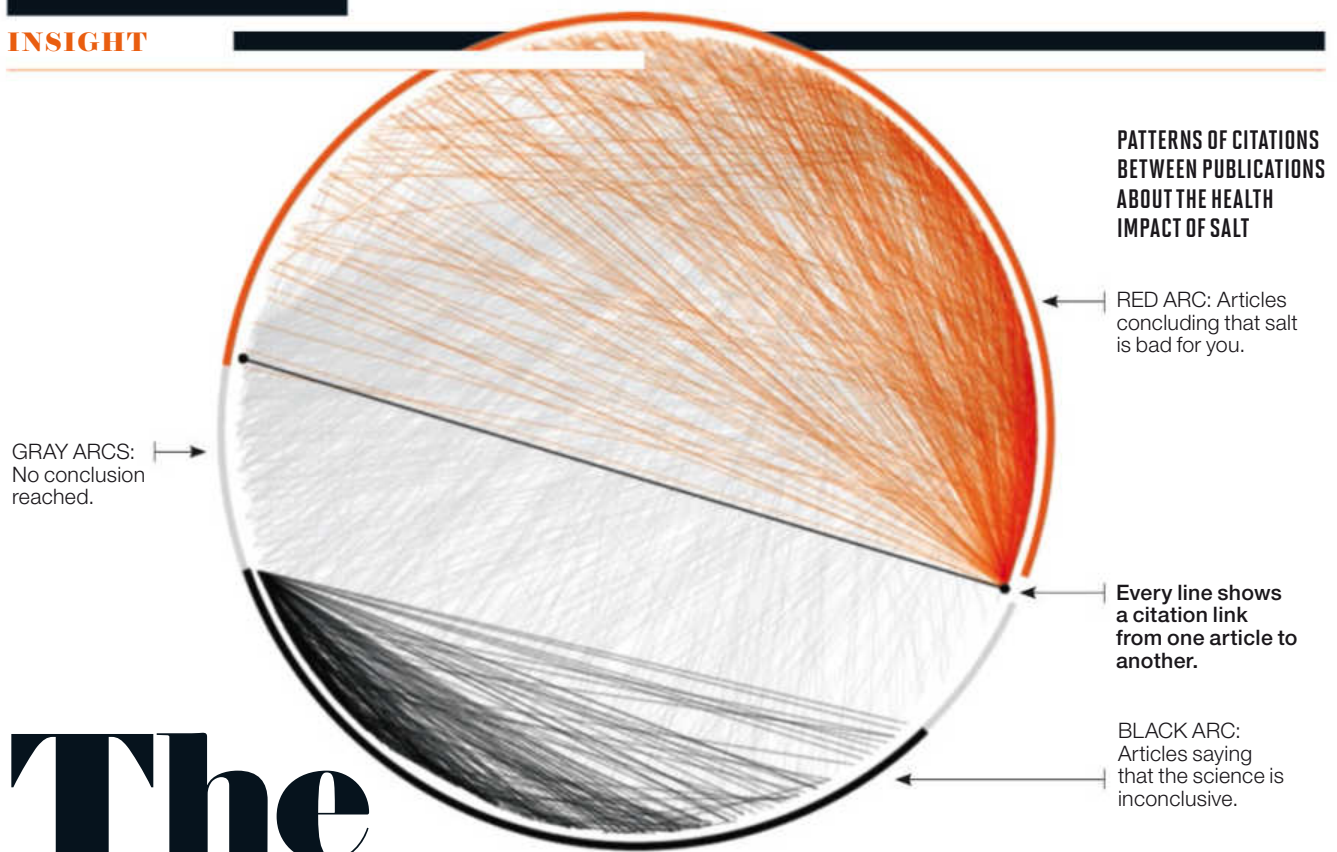
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# The Big Think

YOU ARE WHAT YOU READ: WHAT THE DEBATE OVER SALT CAN TEACH LEADERS.

By Sandro Galea, MD, DrPH

**Innovation. Ideation.** Out-of-the-box problem-solving. Creative decision-making. So much of what we value in the brave new economy depends on people having fertile, expansive, and dynamically open minds. So it may come as a surprise to many that the default state for our minds seems to be, well, “closed.” Or at least inhospitable to ideas that differ from the ones already set in our consciousness.

Remarkably, that’s true even in a realm that has, by reputation, long valued exploring the unknown and challeng-

ing accepted wisdom: academic research. For a telling example, consider the decades-old debate over whether too much salt in the diet is bad for your health.

The answer to that question, to hear some definitive sources tell it, is straightforward: Yes, it is. Witness, for instance, how Thomas Frieden, the director of the Centers for Disease Control and Prevention (CDC), titled a 2010 paper in the prestigious *Annals of Internal Medicine*: “We can reduce dietary sodium, save money, and save lives.” Indeed, Frieden called reducing sodium intake in our diet “the most cost effective intervention to control chronic disease” after tobacco control—a conclusion that underpins the CDC’s current nationwide strategy to reduce the public’s consumption of salt.

Such a strong and clear statement from the leading public health official in this country might make you think there is scientific consensus around the harms of elevated salt in populations and about the potential benefit of reducing levels of salt in our food. That’s far from the case.

Consider what researchers Niels Graudal and Gesche Jürgens wrote the following year in the *British Medical Journal*, another of the world’s most respected medical venues: “It is surprising that many countries have uncritically adopted sodium reduction, which probably is the largest delusion in the

history of preventive medicine.”

The National Academy of Medicine is a distinguished nonpartisan body that is frequently called upon to weigh in on the key scientific and health controversies of our time. In a 2010 report, it made clear that “population-wide reductions in sodium could prevent more than 100,000 deaths annually.” But three years later, the Institute of Medicine (now called the National Academy of Medicine) “determined that evidence from studies on direct health outcomes is inconsistent and insufficient to conclude that lowering sodium intakes below 2,300 mg per day either increases or decreases risk of CVD [cardiovascular disease] outcomes (including stroke and CVD mortality) or all-cause mortality in the general U.S. population.” That’s a mouthful of medicalese, to be sure—but the study’s bottom line is, Nobody has proved salt’s health impact one way or another.

The existence of controversies in science is neither

## READERS HAVE TO BECOME CRITICAL CONSUMERS OF WRITING—TO ALWAYS ASK, WHERE DO THE DATA COME FROM? AND IF OTHER DATA DRAW DIFFERENT CONCLUSIONS?

new nor, in and of itself, alarming. Science is meant to advance through disagreement and the back and forth of ideas. What is noteworthy about the salt controversy, however, is the disconnect between clear divides in the science and the certitude of public health officials.

What could explain this discrepancy?

In a series of papers published over the past few years, my colleagues and I have tried to understand this phenomenon. In papers in the journal *Health Affairs* (2012), in *Science* (2013), and forthcoming in the *International Journal of Epidemiology*, we analyze these two poles in salt research—which, as it turns out, are based on two virtually separate “scientific literatures,” being published by different groups of scientists, each working on their side of the hypothesis, and each referencing each other as they build bodies of work supporting their arguments.

As the field has grown over the past several decades, the polarities have deepened, and the two camps have all but stopped talking to each other. Papers that aim to review the full field instead summarize one side or another—giving us not one but two bodies of knowledge, each firmly aiming to prove only its own thinking. It has thus fallen to public health officials to essentially take sides, choosing between two opposing points of view that the scientists themselves have scarcely tried to reconcile.

This is an unfortunate state of affairs for a matter as important as national health policy, an outcome that presumably would affect hundreds of millions of people.

But it also offers some insights that may be valuable for all of us—lessons about how we draw conclusions from data, and how leaders should act on data.

First, the process of generating ideas gives the illusion of novelty of thought. But very few ideas are new. Most ideas, including what I am writing here, replicate previously articulated concepts, perhaps with different shading and nuance. This becomes a problem when a body of writing deepens our adherence to a particular idea, becoming self-referential and self-reinforcing. We do indeed think what we read—and what we read, often, is written by someone who likewise has read a particular set of prior writings, then refashioned it as his own. This calls for the reader to become a critical consumer of writing, to ask where the writing comes from—and, more important, to determine if there’s other writing outside of the reader’s field of vision that reaches other, perhaps dramatically different, conclusions.

Second, decision-makers must frequently choose a course of action in the face of imperfect data. It is why we pay leaders—to make tough calls when circumstances are murky and the path is anything but clear. But when is it wise to make a critical decision on imperfect information, and when is it the better part of valor to recognize that we simply do not know enough to decide, and to act? It is up to the leader to analyze the data to the best of his ability and figure that out. But to do so smartly, the leader needs to understand the genesis of that data. Would knowing, for instance, that you are reading one half of an evenly split body of opinion influence your assessment of what you’re reading? It probably should.

Third, data analysis, be it in universities or in industry, is conducted by someone with a set of incentives. Those incentives too often encourage people to produce analysis that is in line with some overarching narrative favored by the institution or company in which they work. Often, he or she has very little incentive to pose the tough questions—to look at the other body of analysis and ask, “Why are we finding something different? Can we try to resolve this discrepancy?” The result is manufactured consensus within a group of like-minded thinkers, even if another—equally rational—group of thinkers on the other side of town may have arrived at a different conclusion.

The challenge for all of us is to stay informed, but not fully formed in our views. As the great debate over salt suggests, keeping an open mind may be the healthiest thing any decision-maker can do. ■

*Sandro Galea is dean of Boston University’s School of Public Health.*

# FORTUNE EXECUTIVE TRAVEL

## THE NEW BREED OF HOTELS

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### CHECK IN

News and information on how hotels are reinventing themselves, plus what's new in airline and car rental innovation.

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### LODGING GOES LOCAL

Hotels are no longer just for travelers, as properties turn to local tastemakers and communities to set themselves apart.

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## FROM THE EDITOR



Hotels fascinate me. It's more than the fact that the door may have been held open for me when I arrived or that I may have been greeted with a friendly smile at the front desk. It's that here, much care

has been given to getting everything just right. My comfort has been considered in ways I will never even see or know.

Hotels are also resource-rich. In the lobby, I can ask questions and be certain of an insider's perspective on topics ranging from traffic to cultural insights. I can relax over food and drink, an increasingly local experience. And there's service: Ask for anything, and it will miraculously appear.

Nowhere are hotels more of a refuge than when I'm abroad. Yet, no longer is this comfort limited to travel. Even when I'm

home in New York, I know I can duck in to find a quiet place for a conference call when I'm on the run. Or have a lovely cup of coffee in the lobby with the old colleague I've been meaning to catch up with.

Whether they're on the other side of the globe or around the corner from my office—hotels are truly my home away from home.

*Janet Libert*  
Janet Libert  
Editor

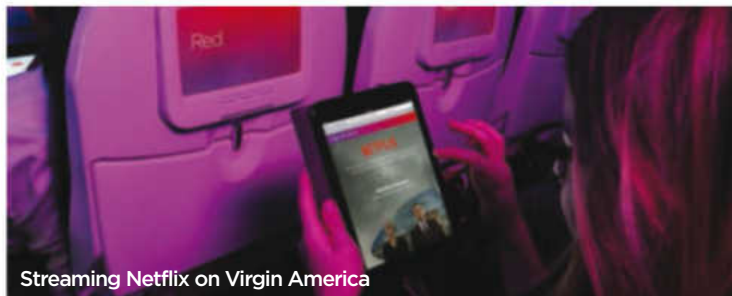
## CHECKIN

BY KAREN GOODWIN

### Small-Screen Streaming

*VIRGIN, JETBLUE OFFER FREE ENTERTAINMENT VIA WI-FI*

Why stop streaming movies and TV shows just because you're 30,000 feet in the air? On Virgin America and JetBlue, you don't have to. Through March 2, 2016, Virgin is allowing Netflix members to stream content to their smartphones, tablets or laptops for free on its 10 new A320s equipped with the new ViaSat Wi-Fi system, which it claims is eight to 10 times faster than other in-flight Internet services. On JetBlue, passengers can stream or download movies, TV shows and music from Amazon via the airline's free Wi-Fi, which will be expanded to all of its planes by the end of 2016.



Streaming Netflix on Virgin America

### THE 10 PRICIEST LUXURY HOTELS IN THE U.S.



Mandarin Oriental, New York

	per night
1. Mandarin Oriental (New York) .....	\$995
2. The Ritz-Carlton Central Park (New York) .....	\$995
3. Baccarat Hotel & Residences (New York) .....	\$990
4. The St. Regis (New York) .....	\$945
5. The Plaza Hotel (New York) .....	\$893
6. The Peninsula (New York) .....	\$845
7. Park Hyatt (New York) .....	\$834
8. Montage Beverly Hills (Los Angeles) .....	\$800
9. SKYLOFTS at MGM Grand (Las Vegas) .....	\$789
10. The Lowell (New York) .....	\$785

Source: Luxury-Hotels.com survey

## BIGGER BINS, MORE BAGS

*NEW OVERHEAD STORAGE CONCEPT FOR THE 737*

Larger overhead bins may be coming to a Boeing 737 near you—resulting, most likely, in a reduction of airline delays. The Space Bin, developed by an engineer at Boeing, can hold six 14-inch-wide, standard-size carry-on bags stowed on their sides, versus four standard-size bags laid flat in a typical 737 bin. Alaska Airlines has already retrofitted some of its 737 aircraft with the bins and will install them on new planes; by the end of 2017, half of Alaska's fleet will have them. American is ordering Space Bins for new 737 aircraft, which may not see service until 2017. Delta and United have also ordered Space Bins for new planes.



Larger Boeing bins

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# CHECKIN

BY KAREN GOODWIN

## SKURTING THE CAR RENTAL LINES

START-UP AT LAX BRINGS CARS TO THE TERMINAL

Ever wish you could pick up your rental car at the airport curb and skip the ride to an off-airport location? You can at Los Angeles International Airport via a car rental app called Skurt. Upon arrival, you are greeted by a company rep in the arrivals area, escorted to the nearby car and handed the keys (no paperwork, since all information is already stored in the app). Upon

return, you drive to Skurt's LAX location near the airport to pick up a rep, who drops you off at the airport terminal and returns the car. Skurt, which partners with independent rental car companies, is targeting San Francisco International Airport as its next location. The app is currently available only for iPhone. Learn more at skurtapp.com.



## ROOMS AND RAILS AT DEN

DENVER'S AIRPORT GETS A NEW HOTEL, TRAIN STATION

Denver International Airport is on a high. The jewel in its crown may likely be the new Westin Denver International Airport—its first on-site hotel, which opened in November. The 519-room property, shaped like a pair of wings, has a conference center, two restaurants, a pool, a spa and a fitness center. The building also houses a transit center—commuter rail service from Denver's Union Station downtown is expected to begin in spring 2016. The airport's internal trains shuttle passengers from the hotel complex to the terminal.



Design for GLō lobby and business bar

## GLōs and Vibs

BEST WESTERN UNVEILS NEW LODGING BRANDS

Best Western Hotels & Resorts is shaking up its 70-year-old image with several new brands. The latest is GLō, a mid-scale boutique hotel for the budget conscious. Construction of GLō properties begins next year; the chain expects to open more than 50 GLō hotels in three to five years, spanning several

continents, including Asia. And by the end of 2016, Best Western plans to open five Vib hotels—targeting young, urban travelers—in Los Angeles, Miami, Staten Island, Little Rock, Ark., and Springfield, Mo. In May, the chain launched BW Premier Collection, its group of independent properties.

## IN BRIEF

✈ Southwest has opened its new \$146 million, five-gate international terminal at Houston's Hobby Airport. The airline launched flights between Houston and cities in Mexico, Costa Rica and Belize. 🍴 All 13 restaurants in celebrity chef Danny Meyer's Union Square Hospitality Group are adopting a no-tipping policy. Restaurants include Union Square Café and Gramercy Tavern in New York and GreenRiver in Chicago. Expect higher menu prices to be baked in. 📱 Amazon Destinations has stopped selling hotel rooms on travel.amazon.com and on the Amazon Local app.



# Starry, Starry **Night** in Suite Regal Comforts

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China Eastern Airlines, the Oriental Gateway



China Eastern Airlines flies from Los Angeles, New York, San Francisco and Hawaii to Shanghai and beyond.

**Chicago service starts March 2016.**





# LODGING

## GOES

# LOCAL

Hotels are no longer just for travelers, as properties turn to local tastemakers and communities to set themselves apart.

By Jeri Clausing

**A**t first blush it sounds almost like an oxymoron. Hotels, whose basic business model revolves around out-of-towners, are turning their attention to the locals.

No, it's not a plan of desperation. The industry is currently riding one of its biggest up cycles in history. But the buzz in travel is all about experiences and sense of place. So hotels are increasingly looking to the community to add personality, drive loyalty and, of course, boost business during slow times.

The trend is especially evident in hotel dining.

In Denver, for instance, one of the city's long-popular watering holes, Elway's, owned by former Denver Broncos quarterback John Elway, opened its second location when the Ritz-Carlton came to town in 2008.

Even as the hotel weathered a slow start at the height of the Great Recession, Elway's drew crowds from day one to what was then considered the outskirts of downtown. It was recently renovated to add the Elway's Room, which has a fireplace and a view into the kitchen,

more bar seating and a new lounge. It offers special brunches on Broncos game days and the All Night, Game Night happy hour on Mondays and Thursdays to drive more bar and lounge business into the evening and liven up the downtown area during non-Broncos game nights.

"A nice perk for locals at our location is complimentary valet in a market where most places charge for this service. No minimum spending required," says Rob Miller, the general manager.

Business at the restaurant, which was the second location for Elway's in Denver, has grown every year since it opened.

In fact, Lisa Holladay, vice president of global branding for Ritz-Carlton, said Elway's success and local personality are "exactly what we are striving for" as the brand works to renovate older properties to give them unique traits, shedding the cookie-cutter image that hotel chains used to strive for.

In New York, the company managing the Holiday Inn in Times Square also sought out a unique local operator to run its restaurant.

The result: a decidedly un-Holiday Inn-like Irish pub called Rattle n Hum West Craft Beer Bar & Kitchen. It's being run by Joe Donagher and Eamon Donnelly, who have the original New York Rattle n Hum and several other Irish pubs in the city.

"Rattle n Hum West will provide our guests with a fun dining and entertainment option," said M&R Hotel Management COO Brian McSherry. "It also will attract Joe and Eamon's loyal following of local customers, who now will be introduced to our hotel, which we hope they will recommend to visiting friends and relatives."

Hotels are also tapping locals to drive business during traditionally slow times for amenities like pools and spas.

The Hyatt Tamaya Resort north of Albuquerque, N.M., for instance, offers day rooms that give locals access to their pools when occupancy drops below 80 percent.

In Sydney, the Old Clare Hotel will give access to its rooftop pool and bar to locals as well as guests when they open next year. The hotel will also open a day spa in 2016, and its lobby bar is already a local

**"WE WANT THE  
COMMUNITY TO  
FEEL LIKE THEY  
OWN THE HOTEL."**

favorite, with craft beers and spontaneous pop-up collaborations.

Dallas's Hilton Anatole, which claims to have the largest collection of art and

antiques at any U.S. hotel, offers specials like free drinks and food discounts to locals who roam the corridors and common spaces to view the collection, which includes pieces that range from 12-foot segments of the Berlin Wall, painted by German artist Jurgen Grosse, to an 18th-century reclining Buddha fashioned in gilt bronze.

The Omni in Dallas livens up the Monday night football scene at its sports bar, the Owner's Box, by bringing in a Dallas Cowboy player to sign autographs and take pictures. And its Nashville property, which has downtown's only full-service spa, Mokara Spa, offers a lunchtime special for business professionals that includes a 25-minute spa treatment and healthy lunch.

Hilton Hotels and Resorts, whose brands include the luxury Waldorf Astoria and Conrad, also recently announced what it calls a

first-of-its-kind spa membership program at select properties around the globe.

The Spa Club offers local memberships that include one massage or facial each month at a minimum discount of 30 percent. And members have full access to the hotel's fitness and spa facilities on the day of treatment. Members also get free parking and other property perks like discounts in restaurants and shops, as well as a minimum five percent discount on any treatment, any time, at other participating properties.

"The Spa Club is designed to serve hotels as a powerful tool to attract local customers," said Ryan Crabbe, senior director of global wellness at Hilton. "The offering energizes other aspects of the hotel outside of the spa and encourages locals to make repeat visits, ultimately making the hotel a familiar favorite."

Crabbe said hotels have traditionally been active in attracting locals to their fitness centers with memberships, but that doesn't often translate to increased spa use because of cost.

"The hotel industry for many years has needed to find a way to offer generously priced treatment to local members," he said.

With the spa membership, locals get discounted rates and access to full spa amenities like the steam room and whirlpool that traditional day spas don't offer, Crabbe said. It also helps the hotels draw business during traditionally slower periods, like weekdays and off-seasons.

Hoteliers say with the modern focus on creating unique properties that let guests truly experience a destination, attracting locals to more than just meeting spaces is key.

Trust Hospitality president Patrick Goddard said his company does a full study of the local community before developing the personality of its boutique hotels.

"We want the community to feel like they own the hotel," he said. "That is central to our philosophy." **ET**

JERI CLAUSING is a freelance journalist whose résumé includes tenures at *USA Today* and AP.

## TAP INTO THE TREND

Hotels have long been used by local businesses for meetings and special events, but as they turn their focus to attracting and engaging with members of their communities, they are making special offers and amenities available to locals. Check your local hotels' websites and follow them on social media; besides the deals, you'll have a window into happenings around town.



**GET SOCIAL** In Sydney, the Old Clare Hotel ([theoldclarehotel.com.au/](http://theoldclarehotel.com.au/)) has a "super concierge," Martin Bray, who acts as an in-person and online resource for locals and guests. He maintains a lively Instagram feed, #TheSuperConcierge, and updates his followers on all things related to the neighborhood, including nuances about the hotel.

**SHARE A PHOTO** Hyatt's new Centric brand has launched a campaign, complete with prizes, that asks locals in Chicago and Miami to post photos using the hashtag #HyattCentricExplorerContest to generate buzz around their favorite city hot spots.

**FIND AN EVENT** Omni Hotels & Resorts has revamped all of its properties' websites to include blogs and sections about their hometowns. Each site includes constantly updated feeds on upcoming events at the hotel and around town.



# Menu for Fun

Taiwan is a delightful blend of cultures, tastes and gifts of nature. CNN "Culinary Journeys" readers voted it the "best food destination in the world" because of the variety of influences, styles and the island's own rich bounty. The hot springs, scenic beauty and healthy lifestyle are equally inviting. Taiwan has a menu for everyone.



## FOODIE HEAVEN

Taiwanese people eat often and eat well. Din Tai Fung's steamed dumplings are legendary. Beef-noodle soup is so popular that there's a fierce competition to make the best. And lurou fan, a sweet and salty braised pork with rice, reigns as Taiwan's favorite comfort food. Oyster omelets, stir-fried calamari and seafood congee are typical snacks. The sushi and sashimi are freshly caught. And milkfish, a flavorful favorite enjoyed in several dishes, is celebrated with a museum and festival.

Passengers aboard EVA Air can choose seasonal, kitchen-fresh Western or Asian meals that include tastes of Taiwan on selected flights.



## HOT SPRINGS

Taiwan is blessed with more than 100 hot springs clusters, each with its own benefits. There are carbonic acid springs with natural massaging qualities, sodium bicarbonate springs said to lubricate the skin, sulfur springs to soften and exfoliate, salt water springs to improve circulation, gentle pure water springs and rare cold springs. These natural springs are found throughout Taiwan, including the Taipei area.

## FREE TOURS

Taiwan Tourism Bureau offers free tours from Taoyuan International Airport for transfer passengers who have 7 – 24 hours before connecting flights. Available to the first 18 travelers who sign up, morning tours depart Terminal 2 at 8 am and afternoon tours at 1:30 pm. Each tour offers a different itinerary. Passengers can sign up at the Tourist Service Center in the Airport Arrival Lobby.

## HALF THE FUN

Aboard EVA Air, flying to Taiwan is a pleasure. On the Boeing 777-300ERs EVA flies across the Pacific, passengers in every seat can watch recent-release movies or television features, listen to music, play a game with a fellow traveler, charge personal devices, track the flight's progress on a 3-D map, work or shop. Passengers on EVA's newest 777s can stay connected with Wi-Fi and use global roaming to text.

EVA is recognized for quality service, high safety ratings, exceptional passenger comfort and convenience. It offers more flights from North America to Taipei with more one-stop connections throughout Asia than any other airline. Travelers can rest, relax or work in Royal Laurel Class business with lie-flat seats, Elite premium economy with extra space and Economy with welcomed niceties.

SKYTRAX ranked EVA among the "World's Top-10 Best Airlines" and the number one airline for "Best Airline Cabin Cleanliness" for 2015. AirlineRatings.com recognized it as a carrier of choice for 2015 among the "World's Top-10 Airlines" and rated its Elite and Economy Classes in the world's top-10 "best for economy plus and economy class travel for 2015."

**Taiwan**

THE HEART OF ASIA

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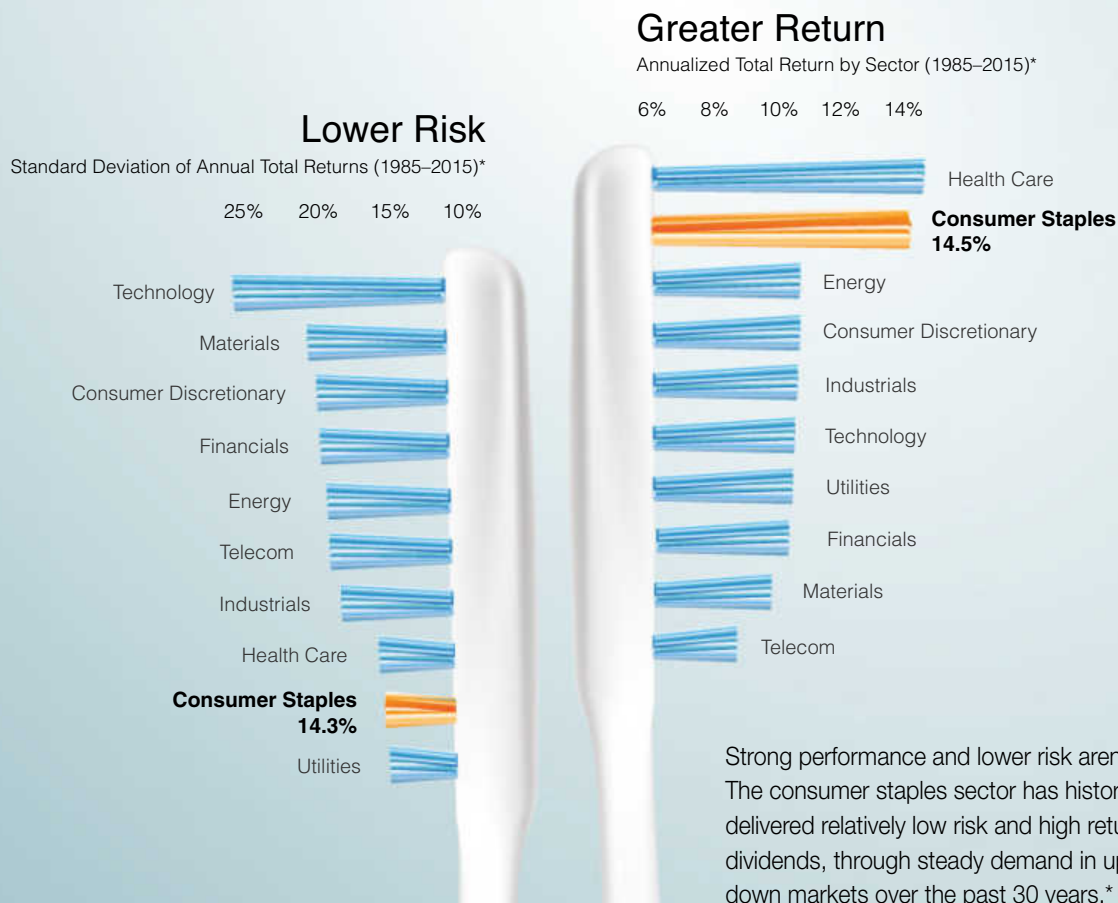
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**Past performance is no guarantee of future results.**

Because of their narrow focus, sector funds tend to be more volatile than funds that diversify across many sectors and companies.

\*Source: Haver Analytics, Fidelity Investments, as of July 31, 2015. Past performance is no guarantee of future results. Sectors are defined by the Global Industry Classification Standard (GICS) and are based off the top 3,000 U.S. stocks by market capitalization.

Annualized Total Return by Sector (1985-2015): Health Care (14.93%); Consumer Staples (14.47%); Energy (11.15%); Consumer Discretionary (11.13%); Industrials (10.94%); Technology (10.73%); Utilities (10.49%); Financials (10.41%); Materials (10.04%); Telecom (9.16%).

Standard Deviation of Annual Total Returns (1985-2015): Technology (25.45%); Materials (20.73%); Consumer Discretionary (19.27%); Financials (19.26%); Energy (19.08%); Telecom (18.93%); Industrials (17.72%); Health Care (15.93%); Consumer Staples (14.32%); Utilities (14.02%).

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FORTUNE

# INVESTOR'S GUIDE 2016

**What to buy, what to  
sell, and what you need  
to know to protect your  
wealth in the year ahead.**

*Photograph by* **STEPHEN LEWIS**

STYLING BY MICHELE FARO—ART DEPARTMENT

# Choose Smart. Buy Cheap. Enjoy the Ride.

Don't let gloom and indecision trip you up. Here's how to find the right investment strategy for you—for 2016 and beyond.

AS WE PUT the finishing touches on this issue, the S&P 500 was up about 1.5% for 2015, not including dividends. Only one other time in the past 25 years had the stock market been that close to flat for a calendar year, according to Vanguard.

But 2015 sure didn't *feel* flat. Startled by oil, ISIS, China's funny-money stock market, and a host of other emotional triggers, investors detonated several noisy stock selloffs—including a drop of more than 10% in August, the first U.S. correction since 2011. Yes, optimists swooped in to buck up the market after each dip. Yet none of those mini-rallies felt like the rebirth of a bull market. Weak earnings and a shaky global economic outlook meant that every celebration came with a one-drink maximum and a 7:30 p.m. last call.

Still, there's a lot to be learned from a flat year—and, in full disclosure, from some of our own missed calls. (Our 2014 picks were down 7%, hurt by premature bets on oil and mining.) It's an ideal time for

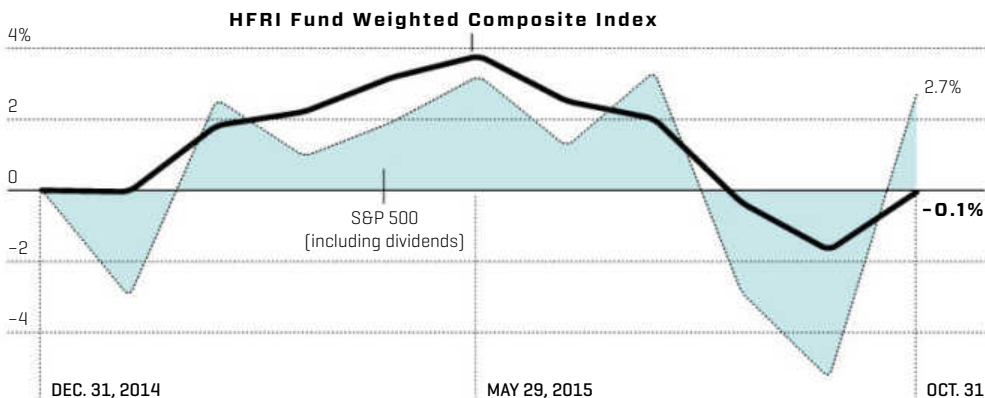
investors to recommit to smart principles and fine-tune their portfolios accordingly. Over the ensuing pages, *Fortune* looks at the year ahead from dozens of angles—reporting on scores of opportunities—and three themes stand out:

**OVERPAYING DOESN'T PAY.** In volatile times, “alternative” investment strategies are supposed to provide an edge that justifies their high fees. But hedge funds have underperformed stocks for 2015 so far (see chart). And private equity's reputation for outperforming the markets has lost its luster, as *Fortune* reports on page 122. It's telling that millennials, who started adulthood at a financial disadvantage to earlier generations, are demanding investment options whose fees don't devour their savings. For more on how they've forced brokerages to adapt, read our story on the rise of “robo-advisers” on page 156.

**CRISES CREATE OPPORTUNITIES.** Stock and bond valuations in the U.S. remain far above historical averages. This year's real and perceived calamities, though, have made the stocks of some strong companies look unusually affordable. Read “Good

## No Edge for Hedges

Hedge funds have fared worse than the S&P 500 in 2015.



Stocks for Bad Times” (page 90), and check out our report on the assets best positioned to weather an interest-rate hike (page 142).

### TECH IS STILL EXCEPTIONAL.

Many sectors of the market are cyclical, fluctuating with the economy's ebbs and flows. But technology stocks may be cycle-proof: As venture capital investor Deven Parekh noted during *Fortune's* expert roundtable (page 102), business leaders can't afford *not* to invest in technological improvements, even when times are lean. For advice on playing the trend, read “How to Invest in the 21st-Century Corporation” (page 164).

By the way, the last time the S&P 500 had an almost-flat year was 1994—and the index went on to register gains of at least 20% in each of the next five years. We don't foresee that kind of bull run, but we hope that our guide will help you thrive, whatever 2016 brings. —Matt Heimer

EVERY ONCE  
IN A WHILE IT'S  
NICE TO REMIND HER  
HOW MUCH  
SHE LOVES  
YOU.



A DIAMOND IS FOREVER

HAPPY HOLIDAYS FROM FOREVERMARK

# GOOD STOCKS FOR BAD TIMES

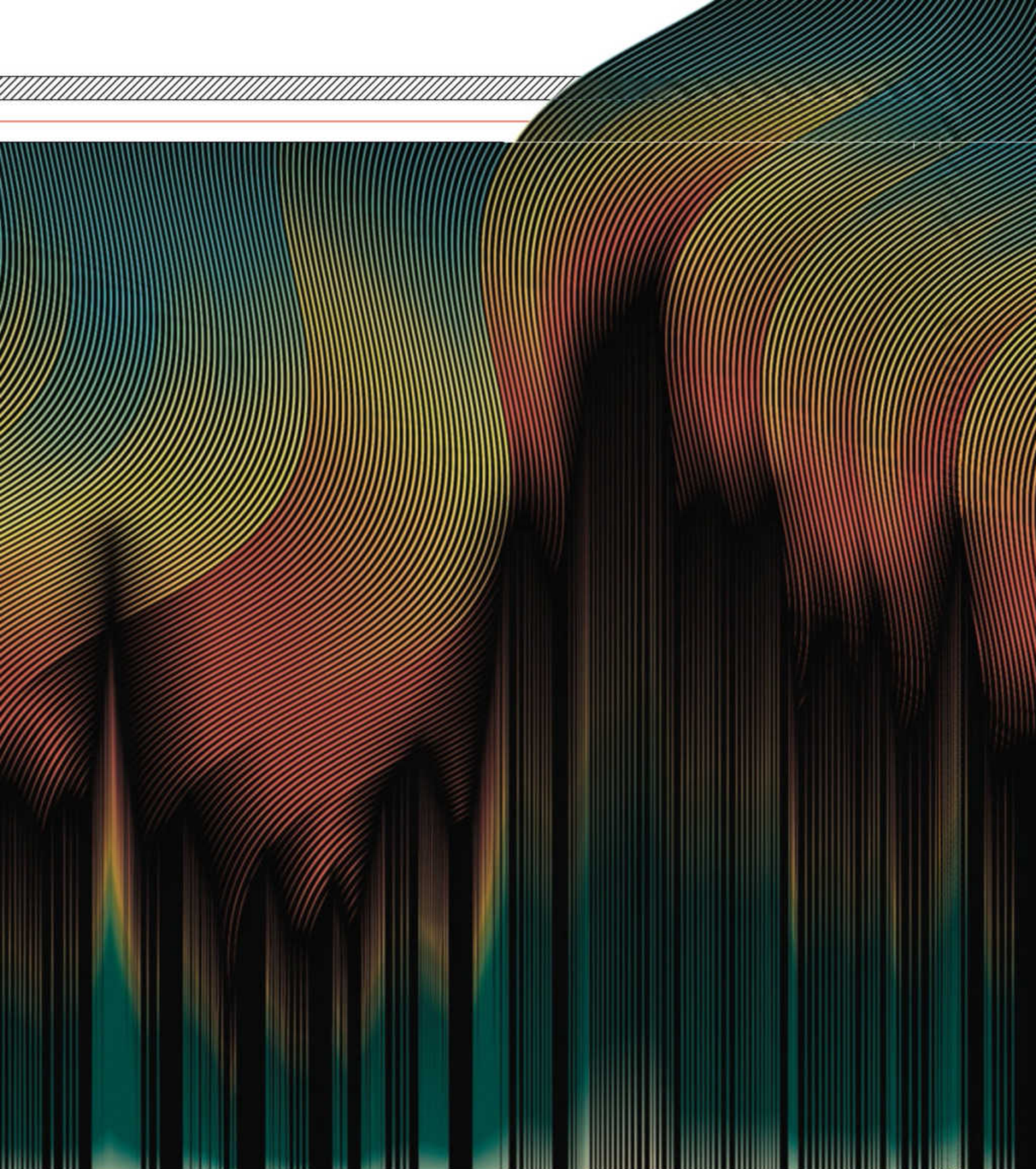
**The world is rife with turmoil and volatility. But we've found 16 investments that offer a measure of stability in the midst of chaos.**

**WHEN IT COMES TO STOCKS**, the only thing that feels certain right now is uncertainty. Perhaps rising wages, low debt, and pent-up housing demand will spark consumer spending and boost the economy and stock market alike. Maybe the war on ISIS and chaos in the Middle East will propel oil prices back to \$100 a barrel and restore the once-lofty stock prices of drillers and military contractors. Or perhaps 2016 will be a repeat of 2015, plodding along with low-single-digit returns and investors waiting anxiously for a signal that it's time to go all-in—or get out. With that in mind we went looking for safety: reasonably valued stocks of established, high-quality companies that don't depend on a scalding economy to perform. No company is immune from outside forces, of course, but these selections offer a modicum of stability in an unstable world.

*By*  
**JON  
BIRGER**

*Illustration by* **MARIO DE MEYER**





## AIRLINES

# Finally Flying High?

**U.S. CARRIERS REENTER THE BLACK:** After years of losses and bumpy skies, domestic airlines are making profits again.



**F**OR DECADES the U.S. airline industry was the corporate equivalent of the Chicago Cubs—a loser of historic proportions. From 1977 through 2012, U.S. carriers posted a collective net loss of \$49 billion, according to the trade group Airlines for America. The causes are well docu-

mented: An obsession with market share led them to fly planes that were 30% to 40% empty. Then 9/11 happened, fuel prices soared, and the Great Recession delivered a crippling blow. American, US Airways, Northwest, United, Continental, and Delta all cycled through bankruptcy.

Since then it's been a happier tale: Reinvention! Profits! Consolidation has largely put the kibosh on damaging fare wars. Discipline has meant fuller airplanes. U.S. airlines had 8% more paying passengers in 2014 than a decade earlier despite operating 17% fewer flights.

The industry is squeezing more revenue out of each flight. Sure, travelers grouse about being nickel-and-dimed on extra-bag fees and \$20 Wi-Fi (as they do about onboard crowding only slightly less dense than New York City subways at rush hour). But customers keep buying tickets and paying for the extras. "Passenger yield," which measures revenue collected for every mile a passenger is flown, increased 35% from 2004 through 2014. The airlines have "done an

absolutely brilliant job managing their businesses," says Jonathan Golub, chief U.S. market strategist for RBC Capital Markets. Airlines have another thing going for them too: lower fuel prices.

Despite big gains for the sector—third-quarter earnings per share rose 45%, according to RBC—investors have kept the stocks

grounded. The NYSE ARCA Airline index descended 12% through Nov. 8, vs. a 1% gain for the S&P 500. "You're seeing results, but investors don't buy it," says Craig Hodges, portfolio manager of the \$270 million Hodges Retail Fund.

The result: a buying opportunity. A diversified way to play the sector is the **U.S. Global Jets ETF**. It holds shares of some 30 U.S. and foreign airlines, as well as a handful of aerospace players, such as Boeing and even General Dynamics. For individual stocks, the best choices are **Delta** and **Virgin America**. Delta is one of Hodges's holdings, and he considers it the best-managed airline in the industry. One example of

## PICKS:

U.S. GLOBAL JETS ETF  
2015 STOCK PERFORMANCE  
**+4.9%**

DELTA AIRLINES  
**-1.6%**

VIRGIN AMERICA  
**-15.5%**

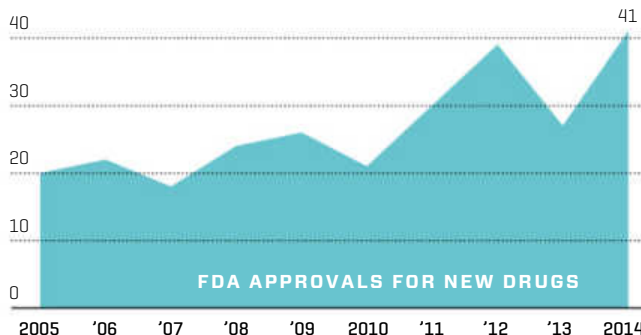
## HEALTH CARE

# Rx for Robust Returns

Delta's forward thinking: In 2012 it purchased its own oil refinery in order to reduce the markups it was paying oil refiners for jet fuel. "They've set themselves up to be the low-cost producer of jet fuel," says Hodges.

Through the first nine months of 2015, Delta's revenue rose 2% and expenses fell 9%, adding up to full liftoff—159%—in net income. Management has been using those earnings to buy back shares (\$425 million worth in the most recent quarter) and increase dividends (Delta's yield is 1.2%). Best of all, analysts expect earnings to increase 23% in 2016; with the stock now at \$49, that equates to a forward price/earnings ratio of 8.5. Given that Delta's median P/E in recent decades has been 11.6, that suggests the shares could reach a comfortable altitude.

Then there's Virgin America, Richard Branson's answer to low-fare leaders JetBlue and Southwest. Virgin pays a rich dividend (yield: 4.9%), trades at a mere nine times projected 2016 earnings, and has embarked on a growth plan that will increase seat capacity by 20% by the end of 2016. Deutsche Bank airlines analyst Michael Linenberg has a \$44 price target for Virgin America. Factor in the dividend yield, and that works out to a 21% one-year total return.



**If you're seeking safety, health care is probably the best prescription. Spending is increasing 6% a year, and new-drug approvals are on the rise. Despite that, S&P 500 health care stocks trade at 16 times forward earnings, vs. 17 for the S&P overall, even as analysts expect big health care stocks to improve earnings 10% over the next 12 months, compared to 7% for the broader index. The only seeming threat is the risk that anger over high drug prices will cause governmental action to rein them in.**

For ETF investors, the **Health Care Select SPDR** offers a broad selection

## Drug Approvals Rise

The Food and Drug Administration has been okaying an increasing number of pharmaceuticals, potentially auguring greater profits.

of stalwarts and biotechs. Our two favorites in this category are **Merck** and **Biogen**. Merck is still harmed by past R&D failures and patent losses on asthma blockbuster Singulair and other drugs. The stock trades at a modest 14 P/E and offers a 3.5% dividend yield. But Merck is more than a value play. New drugs, such as Januvia for diabetes and the Gardasil vaccine for human papillomavirus, are hits, and analysts are enthusiastic about

potential treatments for Alzheimer's, hepatitis, and lung cancer. Merck trades at \$54. J.P. Morgan analyst Chris Schott has a \$66 price target, convinced that Merck has "fundamentally changed."

Between January and March 2015, investors, excited by an Alzheimer's drug now in clinical trials, bid Biogen from \$340 to \$476 a share. Today it's at \$288, afflicted by slowing sales of its multiple-sclerosis drug Tecfidera. Biogen was con-

cerned enough to announce an 11% workforce reduction, with some of the savings to be reinvested in Tecfidera marketing.

Still, the market's reaction seems overblown. Biogen now trades at 16 times projected 2016 earnings, well below its five-year average P/E of 25 and the global biotech average of 35. Analysts expect 12% earnings growth for 2016, but it's the more distant future that gleams. Biogen has three Alzheimer's drugs in development; one, Aducanumab, has been shown in early trials to slow memory loss and remove the brain plaques that are a telltale sign of the disease. With 5 million Alzheimer's patients in the U.S., says Cowen analyst Eric Schmidt, a hit drug could generate \$20 billion in annual sales. He views Aducanumab as "one of the most exciting pipeline candidates in biotech."

## PICKS:

HEALTH CARE  
SELECT SPDR  
P/E (AVERAGE)  
**17**

MERCK  
**14**

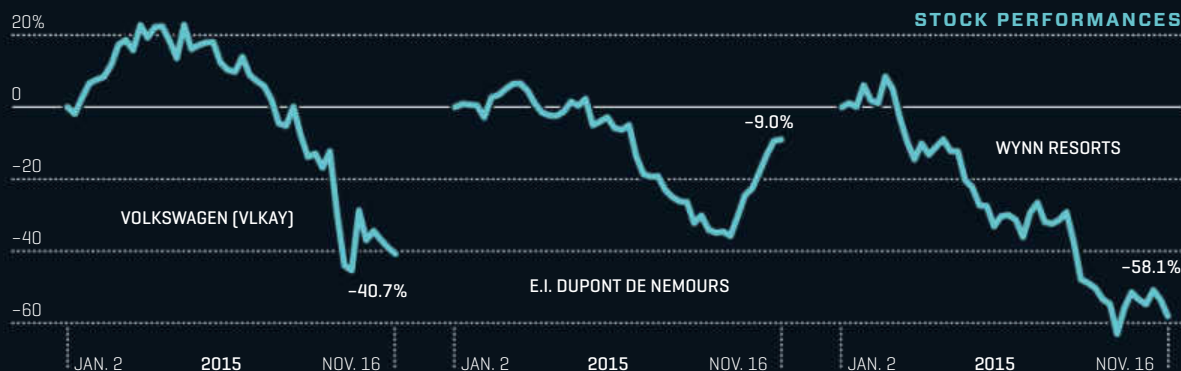
BIOGEN  
**16**

## REVIVALS

## Comeback Companies

## CAN'T REBOUND WITHOUT A FALL:

Volkswagen and Wynn have sustained major stock swoons, both based on problems that will eventually be solved. DuPont's slip is less dramatic, but it remains a turnaround candidate.



**T**

HERE ARE ALWAYS values to be had among companies whose stocks have plunged. The trick, of course, is to identify those whose fall is temporary or whose stock has been excessively punished. **DuPont, Volkswagen, and Wynn Resorts** are three 2015 losers we think are poised for rebound.

Chemical giant DuPont is a turnaround story. Activist investor Nelson Peltz lost a proxy battle to get two seats on its board, but he may be winning the war. CEO Ellen Kullman, his nemesis, stepped down in September, and DuPont's stock immediately shot up. Still, the shares are down 12% since March.

With a P/E of 20, DuPont isn't cheap for a mature, old-economy stock. But John Linehan, manager of the T. Rowe Price Equity Income Fund, says its earnings have been depressed by overspending, particularly on R&D. He thinks \$2 billion a year in costs can be wrung out of DuPont, which recorded \$3.6 billion in net income in 2014. Linehan believes those savings would be worth an extra \$20 a share, and he has faith in interim CEO Edward Breen to get the ball rolling. "Ed Breen cleaned up Tyco after [the fall of CEO Dennis Kozlowski]," says Linehan. "He split the company into several pieces, and in doing so unlocked a lot of shareholder value." He expects a similar turnaround for DuPont, one that could include a sale of its struggling agricultural seed business.

The VW scandal, in which it admitted fitting 11 million diesel vehicles with software that can cheat nitrogen oxide emissions tests, is one of the biggest of the year. The fines and the cost of recalls will extend into the billions. However, there is a long history of big automakers rebounding from similar scandals, and VW's business is fundamentally sound.

VW shares have crashed by 50% since April and trade at 0.6 times book value and 12 times 2016 earnings estimates (which have been dramatically reduced). Morningstar analyst Richard Hilgert considers the stock "oversold" and has a \$42 target price—68% above where it trades now.

Bernstein analyst Max Warburton has argued that the scandal will have "very little impact" on VW's sales or brand. Indeed, its North American sales increased 6.8% in October. One caveat: It's impossible to predict the total cost of VW's fines, recall costs, and civil liabilities, and it's entirely possible the shares will fall further before they rebound. As a result, consider VW not a

## PICKS:

DUPONT  
2015 STOCK PERFORMANCE  
-9.0%

VOLKSWAGEN  
-40.7%

WYNN RESORTS  
-58.1%

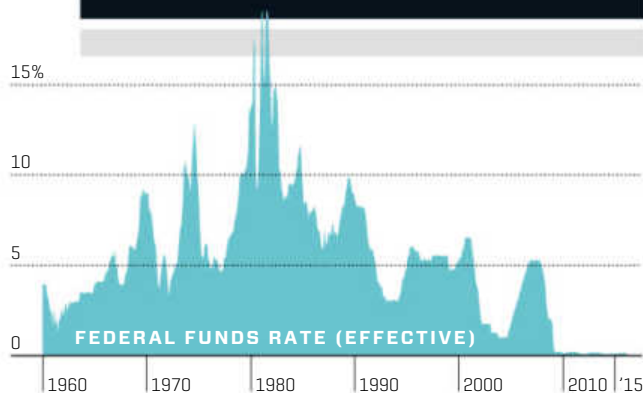
core holding but rather one aggressive investment in a well-diversified portfolio.

Wynn Resorts has fallen even more than VW, with the stock of the hotel and gaming giant tumbling from \$149 to \$61 a share in 2015. The negativity centers on the company's 72% stake in Wynn Macau, a resort and casino on the Chinese coast near Hong Kong. An anticorruption campaign in China has big spenders fearful of visiting Macau casinos, and the Macau government is seeking to limit the number of gaming tables at Wynn's operation—a move CEO Steve Wynn labeled “preposterous.”

Those troubles mean opportunity. Shares of the Macau unit, traded in Hong Kong, have declined 50% this year. Yet even after that, Wynn Resorts' 72% stake in Wynn Macau is still worth \$5.1 billion. To put that in perspective, Wynn Resorts has a market cap of \$6.3 billion. Add the operating income Wynn Macau generates for the parent company, and investors in Wynn Resorts are basically getting Wynn's U.S. operations for free, says Staley Cates, chief investment officer of Southeastern Asset Management, which owns shares of Wynn Resorts. He thinks the stock is worth double its current \$61. Says Cates: “Steve Wynn is the best creator of value in the industry.”

## THE FED

# Banking on Rising Rates



**Forecasting interest rates is a dangerous game. Nevertheless, every sign suggests that, this time, the Federal Reserve really, really, really means it and will start raising rates. [For a different view, see “How to Fight Your Fear of the Fed.”] Surprisingly strong wage and jobs growth are just the latest signs that the Fed needs to take action to tamp down inflation.**

Bank stocks should benefit. Traditional lenders profit on the difference between the cost at which they borrow money and the higher rate at which they lend it out. When rates are low, that spread—

## Ready to Climb

After years at historically low levels, the Federal funds rate seems destined to rise.

known as the net interest margin—gets compressed. Higher interest rates should translate to wider net interest margins and thus bigger profits for U.S. banks. One way to cash in on this is with an ETF. A good choice is **SPDR S&P Bank ETF**, which emphasizes mid-size players rather than the megabanks perpetually in regulators' crosshairs.

Two stocks poised to prosper are **Charles Schwab** and **Capital One**. Schwab is known primarily as a discount broker-

age, but its trading commissions actually represent only 14% of its revenue. The much bigger portion comes from Schwab's bank—one of the nation's largest, with \$100 billion in assets—and its money-market funds, where brokerage and advisory clients park their cash. A more normal rate environment would probably triple the profitability of the money-market funds.

At first glance, Schwab's shares seem pricey—a forward P/E of

25—but that's actually a discount to its five-year average of 32. And analysts are projecting a 33% increase in profits next year. Margaret Vitrano, manager of the Clearbridge Large Cap Growth Fund, believes Schwab can sustain that success. “This is one of the stocks with the most leverage to the upside [when rates go up],” she says. “Plus, it's a really good business.”

Capital One is modestly priced—at \$77 a share, it has a P/E of 10—and offers a 2% dividend yield. Known for its credit cards, Capital One has been aggressively building its branch network and retail deposits. The wisdom of that will be apparent once rates start to rise, says Bill Nygren, manager of Oakmark Select. He thinks Capital One deserves a P/E closer to 15—which equates to \$117 a share.

## PICKS:

SPDR S&P  
BANK ETF  
P/E (AVERAGE)  
**15.3**

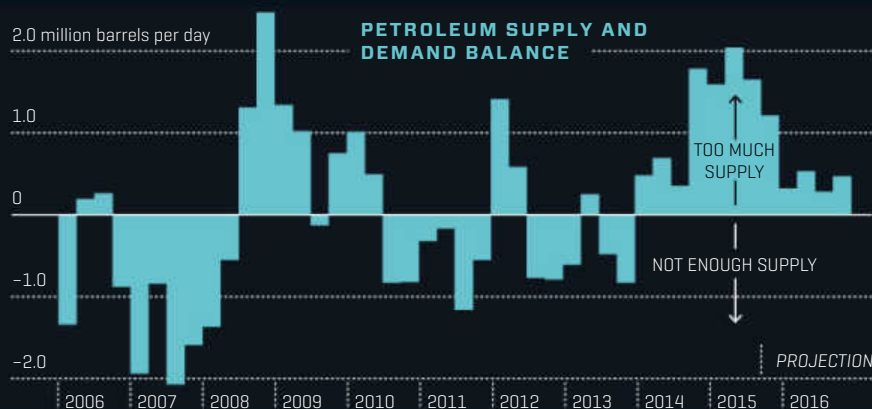
CHARLES  
SCHWAB  
**25**

CAPITAL ONE  
**10**

## ENERGY

## Oil Bubbles Back Up

**BACK TO BALANCE:**  
The gap between supply and demand is falling, suggesting a price rebound in the offing.



**V**ADIM ZLOTNIKOV, the chief market strategist at AllianceBernstein, has low expectations for 2016. His prediction: 5% to 7% total returns for the S&P 500. In the past we've had technology or real estate or China pushing the market upward. "Today it's just not clear where we are going to find the next growth driver," he says.

His favorite idea in today's environment: integrated oil stocks. They pay good dividends, and even with lower oil prices, those dividends are sustainable, as oil companies are spending less on drilling, exploration, and other capital expenditures. "On top of that you're getting a free option in case there is a geopolitical event that causes oil prices to spike," he says.

Given how low crude prices are—they've fallen from \$105 to \$40 a barrel since July 2014—it's arguable whether you would even need global upheaval to cause a spike. Small shifts in supply or demand can have an outsize impact, and it's clear that surging supply in North Dakota and Texas contributed to depressed prices. New drilling has slowed—but global oil consumption still increased 2% in the third quarter, according to the International Energy Association.

OPEC production is always a wild card, but the IEA expects non-OPEC output to decline in 2016. If overall production is flat, it wouldn't require much demand growth for a 25%

increase in the price of oil. That's exactly what traders are predicting in the futures market for a year from now. "Demand [for oil] has been resilient, so it's all about supply," says Jeremy Zirin, chief U.S. equity market strategist at UBS. His prediction: Oil will rebound to at least \$60 a barrel.

That's hardly a boom price, but it would pay off for oil-stock bargain hunters. History shows

time and again that **Exxon Mobil** has been a winner. Yes, it has faced a double whammy, first with lower oil prices and then with heat over whether it misled on climate change (which the company denies). Sure, its profits have sagged, but for Exxon \$20 billion in earnings is a bad year, and it will come back. In the meantime, investors are paid to wait: With the stock now down to \$78 a share (from \$97 in November 2014), its dividend yield is 3.7%.

Our other oil pick is more contrarian: **TransCanada**. The Obama administration's long-delayed decision to reject the company's Keystone XL pipeline dragged the stock down all year, from \$49 to \$31 a share. Robert Kwan, energy analyst with RBC Dominion Securities, thinks that even without Keystone the stock could reach \$59 in a year. Add the 4.8% dividend yield, and you'd have a 100% total return. Earnings have been up in 2015 because of higher oil-pipeline earnings, and Kwan anticipates 13% profit growth in 2016 as the company is slated to open two gas pipelines in Mexico.

"It's a stock trading near its 52-week low," says Hollis Ghobrial, an analyst with Westwood Funds, which has a sizable TransCanada position. "It's got a 5% yield. Management has [implied] 8% to 10% dividend growth through 2017. And you've got some other pipeline projects—one in Mexico—underpinning that growth. There's a lot to like."

## PICKS:

EXXON MOBIL  
DIVIDEND YIELD  
3.7%

TRANSCANADA  
4.8%

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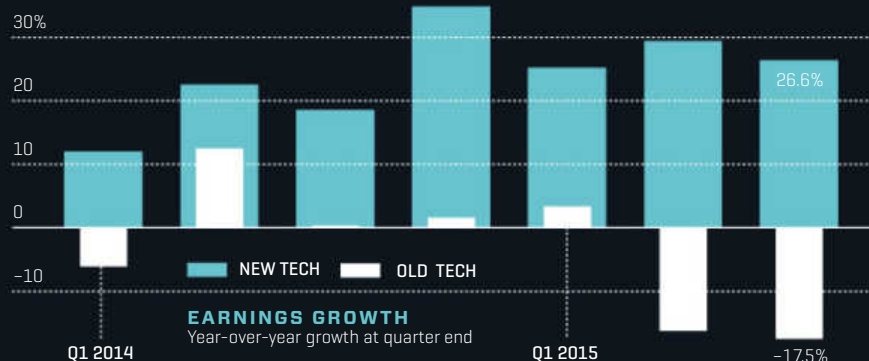
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## TECHNOLOGY

## Big Tech Gets Bigger

## A FEW BIG WINNERS:

A handful of leaders, such as Google, Apple, and Facebook (in blue), have far out-earned IBM, Oracle, Intel, and Qualcomm (white).



NOTE: "NEW" TECH: APPLE, FACEBOOK, AND GOOGLE; "OLD" TECH: IBM, INTEL, ORACLE, AND QUALCOMM

**U**NLIKE ENERGY, the tech segment of the S&P 500 has thrived this year, returning 7%, vs. 3% for the index as a whole, and analysts expect that outperformance to continue in 2016. Still, you need to be choosy. The new generation of tech leaders is leaving the old-generation rivals in the dust. In the second and third quarters of 2015, the triumvirate of Apple, Google, and Facebook produced average earnings growth of 30% and 27%, respectively, whereas the earnings of old-tech stalwarts Cisco, IBM, Intel, and Qualcomm declined 16% and 15%. Says RBC's Golub: "In tech, it's winner take all."

Our two favorite stocks here are **Google** and **Microsoft**. Of course, Microsoft epitomizes "old" tech, and the market assigns it the valuation of a venerable enterprise—a forward P/E of 17. But CEO Satya Nadella is repositioning Microsoft as a leader in cloud computing. "He's done an incredible job in a short amount of time realigning the company," says Steve Jue, senior analyst at Rainier Investment Management. And already Nadella has begun moving Microsoft's stock price out of a decade-long funk. (Let's not forget either: This is a company that is generating \$12 billion in annual profits even in what in sports terms would be called a rebuilding period.)

What does Microsoft's realignment look like? It means consumers are paying to download Office online rather

than buying it in a box from Staples. It also means corporate clients are using Azure, Microsoft's corporate cloud, for data storage, enterprise software, and other functions that were once handled in house. "A couple years ago Microsoft was considered yesterday's technology," says Vitrano of Clearbridge Large Cap Growth. "Now they're a leader in the cloud." The transformation isn't complete, but in the meantime,

## TOP PICKS:

GOOGLE  
P/E  
20

MICROSOFT  
P/E  
17

Microsoft has been rewarding shareholders with dividend increases and stock repurchases—\$7 billion worth in the most recent quarter. Its dividend yield: 3.1%.

With Google—officially now "Alphabet"—no transformation is necessary. It's hitting on all cylinders: Third-quarter earnings soared 44%—the kind of growth rate that more than justifies the stock's forward P/E of 20.

Most of the growth and earnings are from the core search and advertising business. The stock market is virtually ignoring the value of the investments Google has made in businesses such as Nest and in technologies such as driverless cars. "A few years ago it looked like the investment Google was making in driverless cars was just burning money," says Nygren of Oakmark Select. "Now it's clear they've accumulated one of the best, if not the best, [intellectual-property] portfolios for driverless cars."

That is also why Nygren believes the stock market is undervaluing the \$128 a share in cash that Google has on its balance sheet. "The cash sitting on the balance sheet is being valued at nothing by the P/E investor," says Nygren. "The fact is that Google is building a very interesting venture capital portfolio, so the only way that cash is worth zero is if you believe it will never be deployed into something valuable." ■

# Where Do We Go From Here?

**DEVEN PAREKH**

Managing director,  
Insight Venture Partners

**PICKS FOR 2016****Enterprise software:**

Shaky earnings won't stop  
companies from investing in IT.

**SAVITA SUBRAMANIAN**

Head of U.S. equity and quantitative  
strategy, Bank of America Merrill Lynch

**PICKS FOR 2016****Large-cap companies**

with pricing power.  
[Think Disney.]

**JOSHUA M. BROWN**

Moderator; CEO, Ritholtz Wealth  
Management

**BURNING QUESTION**

**Where do you find stock-price  
growth** when the earnings outlook  
is weak?



The global economy may be growing, but that doesn't mean smooth sailing for stocks and bonds in 2016. The market experts on our panel see a potentially rocky year ahead; here's how they—and you—could profit from it.

*Interview by*  
**JOSHUA M. BROWN**

*Photographs by* **REED YOUNG**

**KATE WARNE**

*Investment strategist,  
Edward Jones*

**PICKS FOR 2016**

**Consumer stocks:**

Spending by U.S. consumers could boost Lowe's and Visa.

**SHAWN DRISCOLL**

*Portfolio manager, T. Rowe Price global  
natural-resources equity strategy*

**PICKS FOR 2016**

**Gas distributors:**

They aren't household names, but they're cash cows.

**JAMES CHANOS**

*President and founder,  
Kynikos Associates*

**BEAR CALL FOR 2016**

**Beware health care:**

Drugmakers and insurers will face pressure to cut prices.



A

**F**TER MORE THAN six years of rising stock prices and sky-high bond valuations, investors braced themselves for a tumble in 2015. Instead, they got a seesaw year in which major U.S. indexes stayed relatively flat—even as China's slowdown, plummeting oil prices, and a looming

interest-rate hike gave them night sweats. There was plenty of anxiety and volatility, and not much clarity.

To supply some of that precious commodity, *Fortune* convened our annual roundtable of market experts to talk about where investors might make money in 2016. Our panel included James Chanos, president of \$2.5 billion hedge fund firm Kynikos Associates; Kate Warne, investment strategist at brokerage Edward Jones, which oversees \$888 billion; Deven Parekh, managing partner at Insight Venture Partners, a tech-focused venture capital firm that has raised over \$13 billion; Savita Subramanian, head of U.S. equity and global quantitative strategy at BofA Merrill Lynch, which has \$1.9 trillion under management; and Shawn Driscoll, portfolio manager of T. Rowe Price's \$5.2 billion global natural-resources equity strategy. Here, edited excerpts from their discussion.

**JOSHUA M. BROWN: Ladies and gentlemen, as of this week the S&P 500 is essentially flat for 2015. Earnings are basically flat, and revenues are actually down 4%. We have stock market multiples that are slightly elevated, but that's because rates are very low. Do we think that this is probably the way things continue for a while?**

**JAMES CHANOS:** Well, it's even worse than you said, Josh, because earnings not only are down, but actual GAAP earnings are down for the S&P 500, and more important, the dispersion is even not as great as you think. Excluding oil, earnings are

up slightly, but without share buybacks, they'd be down per share. And that's the other key thing: We've had financial engineering keeping earnings per share up for a while.

**KATE WARNE:** We have all the companies talking about how they're making earnings in the rest of the world, but when they bring them back into dollars, they're down. Part of it is the drop in oil. Part of it is the stronger dollar. If you take those two things out, we don't have strong earnings growth, but we actually do have some earnings growth, and that's actually really important.



**SAVITA SUBRAMANIAN**  
ON THE DANGERS OF DEBT

"S&P 500 companies with high-yield debt are trading at a discount to S&P companies with investment-grade debt for the first time since 1994. The market is getting rational again—we are being compensated for taking risk and are paying up for safety."

**Deven, as a tech investor do you have a view on that?**

**DEVEN PAREKH:** Insight is obviously focused more on technology, and we're still seeing relatively strong growth in the underlying investment. If you look across almost every sector of GDP, nothing has had the growth that that sector has had over the past five or six years. By some estimates, the software market

alone has roughly quadrupled in size over the past 10 years, to \$400 billion-plus. The other thing that we see is that non-tech revenue growth has been challenged. A lot of earnings growth has come from expense reductions. That story can only last for so long.

**Kate, you've said without earnings growth, it's tough**



**JAMES CHANOS**  
ON THE “CHINA STIMULUS”

“Thirty percent of global GDP is either China or the people that sell to China, i.e., Australia, South America, Africa. So a third of the globe is now basically downshifting. [China’s growth] was an immense stimulus program, and it’s winding down.”

**to make a bullish case based on current stock prices. Where will we see growth come from?**

**WARNE:** We don’t expect to see such a large drop in oil prices over the next year. Nor do we expect such a strong rise in the dollar. The rest of earnings growth, yes, is partly due to financial engineering, but is also due to cost cutting and to some

of the mergers we’re seeing. I think we see single-digit earnings growth next year if those two factors hold.

**Savita, what’s the view from Bank of America Merrill Lynch on earnings growth?**

**SAVITA SUBRAMANIAN:** Next year could be a better year, for these two reasons: We’re forecasting about half as

much dollar strength next year as what we saw this year—that’s less of a drag on S&P earnings. If oil prices stabilize, that could again represent a removal of this massive headwind that we saw this year.

**Shawn, you’re in the resources space. You’ve been bearish on energy and other commodities. Do you see more of the same? We went below \$40 on crude in November.**

**SHAWN DRISCOLL:** I would say there’s more pain to go in oil, and that’s why I probably have a different view than some of the people here about how 2016 is going to shake out.

I see oil going down to operating cash costs, which we think are \$25 to \$30 a barrel. We think the oversupply will persist for 2016. It was roughly 2 million barrels a day. We think it’s going to be roughly 1 million barrels a day. When oil prices hit the \$10 low in 1986, OECD [Organization for Economic Cooperation and Development] days of inventory were at about 70 days, and our models would suggest we’re going to hit that in June or July.

And frankly, if we see that, there’s worrying signs in the high-yield market. Energy and metals and mining represent about 20% of the high-yield index. I could see

tightening in credit conditions as a result of a credit event around commodities, and my guess is 2016 is going to be pretty disappointing as a result.

**If crude oil sees \$30, what does that do to stocks? Conceivably the headlines would be about carnage of North American-focused producers, and there might be geopolitical ramifications as well.**

**SUBRAMANIAN:** Sure, it’s not a great scenario. I think that we would see a little bit more of the same of what we’ve seen over the past six years, which is that the market has basically assigned premiums to two areas. One is safe dividend-yield or defensive bond-like stocks, and the other is idiosyncratic companies like tech, like biotech, which have no cyclical but just have really strong growth way out in the future.

**So we would pay up even further for companies that are divorced from the economic cycle?**

**SUBRAMANIAN:** Exactly. We could see multiples go through the roof for those two areas of the market.

**WARNE:** I think that the other thing to ask is how long oil prices stay in the 30s, because you do get a lot of production capacity shutting down—at that point, you

have many producers who aren't covering their costs. Then what you've got is a situation where you finally get the capacity reduction that everybody has been waiting for.

**Shawn, do you share that view, or do you think it's a more prolonged downturn?**

**DRISCOLL:** In 1986, we hit \$10, and within 12 months, we were back to \$20. But it was a long bear, and I think if we're right, and there's an event in the credit cycle, that's going to take a little while to wash out. I think the new 10-year normal for oil is about where we are, 40 bucks. I think the real oil price over 150 years is in the 30s in 2013 dollars. Productivity and new technologies have changed the cost curve and collapsed it.

**So, Jim, I want to go to you on commodities. Crude oil is down 63% from its peak. Since 2011, silver is down 70%. Gold is cut in half, just about. Copper is down 55%. Can you actually have global economic growth with raw materials having literally no floor?**

**CHANOS:** We've done a lot of work on the commodity cycle and found some interesting numbers, to frame what happened in the '90s and then into the millennium. Global capital spending for the big

publicly traded miners went from \$4 billion a year in 1991 to \$14 billion a year in 2001. And that was really good growth in the '90s. China entered the WTO [World Trade Organization] in '01. And then the game went on steroids. Global mining capex went from \$14 billion a year in 2001 to \$125 billion a year in 2012.

That is basically the story of emerging markets and China over the past 15 years. And it's not just China: 30% of global GDP is either China or the people that sell to China, i.e., Australia, South America, Africa. So a third of the globe is now basically downshifting (depending on your view of China's accounting) either dramatically or at least at a reasonable glide path. That's going to be a drag on general global growth because China is one percentage point of global growth, and the rest of emerging markets selling to China is about one point. That's a pretty strong headwind. I think we underestimate the knock-on effects that China's 15-year, once-in-a-lifetime urbanization meant for the rest of the world. It was an immense stimulus program, and it's winding down.

**We keep saying tech is this idiosyncratic engine of growth. Facebook is now a \$300 billion market cap**

**company. Google is past \$500 billion. Are there enough opportunities that haven't been fully exploited? And where else can investors find growth?**

**WARNE:** I think lower commodity prices are benefiting not just tech, which isn't very commodity intensive, but consumer staples, consumer discretionary companies.

I'd look at companies like **Pepsi**, where basically you're still getting that growth, not because there's lots of demand growth but because there's lower commodity prices coming in.

More broadly, look for companies that can consistently deliver earnings growth due to their sustainable competitive advantages and that also have a track record of raising their dividends. Consumers are nesting and connecting, so look at **Lowe's**, which is benefiting from the housing rebound and faces limited online competition. **Visa's** above-average growth should continue as consumers worldwide shift away from using cash. **Novartis** has one of the best drug pipelines in the industry, and the aging global population means rising demand for all three of its business lines.

**Deven, where are the opportunities for the investor looking at 2016 and saying, "I want growth, but I don't want to feel foolish if the cycle does turn?"**

**PAREKH:** You mentioned that in tech the rich are getting

richer. And that's true in certain subsegments. Internet advertising (like **Facebook** and **Google**) would be a great example of that.

But software provides a different case in point. If you look over the past five years, and you analyze the market in three categories—the top 10 companies in revenue, and then 11 through 100, and then the rest of the industry—companies one to 10 over the past 10 years have lost market share, 11 to 100 have basically been constant from a market-share standpoint, and the rest have picked up about 11 points in market share. The entire pie has doubled in terms of actual dollars over the most recent five years.

**So what areas within software should investors be looking at? Is it cloud? Is it CRM [customer relationship management]?**

**PAREKH:** We focus on enterprise software, and then we focus on consumer Internet. We believe there's still tremendous opportunities in both sectors. I view software as enabling the world. There's not a business process that software doesn't enable: Whether you go to the ATM in the morning or you get into a cab, software is touching a bigger and bigger percentage of that interaction.

If you talk to *Fortune* 500 companies—and we spend a lot of time talking to them—all of them say their highest return on

investment, from a capex standpoint, is in software.

And so they're all generally increasing IT budgets. IT budgets have been on a 15-year growth path. I think they'll be on another 15-year growth path.

The reason why I'm not as bought into everything having to be disruptive is illustrated by consumer [financial tech]. There's a whole world of consumer-focused fintech that's been funded—for example, lending clubs and funds transfers businesses. These companies are aiming to disintermediate areas of **Citibank's** and other large banks' overall broad-based business.

One of the things that people underestimate is that financial brands still have value. We're not investors in **Lending Club**, but if you were to ask them which is one of their fastest growth channels, they will tell you it's direct mail, which is not really sexy. And if you think about their unaided [brand] awareness, my guess is it's not very high.

However, if you think about Citibank's unaided awareness, it's extremely high. So what are banks doing? They're not under-reacting to this disintermediation; they're actively coming up with better technology solutions to provide similar services to their consumers, or acquiring the startups with the same business models but next-gen technology. This is true across lots of industries.



**DEVEN PAREKH**  
ON ENTERPRISE SOFTWARE



**KATE WARNE**  
ON AN UPSIDE OF PESSIMISM

“If you talk to *Fortune* 500 companies, all of them say their highest return on investment is in software. IT budgets have been on a 15-year growth path. I think they'll be on another 15-year growth path.”

“It wouldn't take much good news to exceed gloomy expectations and give stocks a boost. That means the outlook is better than you might think, thanks in part to still-low rates and solid consumer balance sheets.”

### **Shawn, in energy and resources, where can we make money next year?**

**DRISCOLL:** There are a couple of ways that I'm trying to create alpha in our strategy. One of these is gas LDCs—[local] distribution companies that provide natural gas for heating purposes. The infrastructure to get the gas to your house is really old, and the need to replace those pipelines from the 1970s allows these companies to grow their rate bases.

There are upper-single-digit growth companies that will do well in a turbulent economic environment. You're getting 3%-plus dividends on top

of the underlying business growth. **Atmos Energy** and **NiSource** are the two we like the most in this area. I think both are potential [acquisition] targets, where we have the possibility of capturing significant upside in a single day.

The other area that I like long term is the specialty chemical area. They're at the end of the chain as far as petrochemicals are concerned. So their inputs are theoretically falling, but they sell brands to consumers—they don't have to lower

prices. One of our biggest specialty chemical holdings is **RPM International**, which sells coatings primarily into the U.S. construction market through big-box retailers. It owns brands like Rust-Oleum and DAP; it plays well into our structural view that the consumer wins at the expense of commodity producers. It has raised its dividend 41 years in a row.

### **Savita, where should we go in 2016?**

**SUBRAMANIAN:** Look, I mean everything that everybody


**SHAWN DRISCOLL**  
ON CHEAP OIL


**"I think the new 10-year normal for oil is about where we are, 40 bucks [a barrel]. Productivity and new technologies have changed the cost curve and collapsed it."**

has talked about suggests pretty strong disinflationary forces on the markets. Uber is putting pressure on taxi prices. Hotels are being hurt by Airbnb. Demographics is another disinflationary force at play, where the elderly spend less on stuff like clothes and cars and more on health care.

I think that companies with pricing power are going to win, and pricing might be more important than it's ever been in a disinflationary environment. And what's kind of surprising is that a lot of companies with pricing power reside in these big global brands. Companies like **Disney**: Even through the worst recession that your middle-class American has ever felt, we were still willing to pay 6% price increases a year to take our children to theme parks.

**The last thing you'll stop spending money on is your kids.**

**SUBRAMANIAN:** You're going to continue to spend on your kids because they whine, and you want to make them happy. That's just one example. But any company that

can really price is where you want to be.

**Your research recently pointed out that there have been seven consecutive weeks of outflows from small-caps. And you've said that's corresponding with weakening fundamentals for the companies themselves and the view of a likely rate hike not being necessarily great for these companies. Is that a theme that you think continues?**

**SUBRAMANIAN:** Yeah, I think we could be in a bull market that's again led by larger mega-cap companies. Small-caps are the ultimate credit plays within equities. They rely on capital to grow, and as that cost of capital increases, we're seeing hiccups in the credit market. We're seeing issues—fundamental growth within small caps has been anemic.

Interestingly, stocks with credit sensitivity are starting to take it on the chin. Note that S&P 500 companies with high-yield debt are trading at a discount to S&P companies with investment-grade debt for the first time since 1994. The market is getting rational again—we

are being compensated for taking risk and are paying up for safety.

**Jim, what do we do with our money next year?**

**CHANOS:** Well, since I'm a glass-half-empty kind of guy, I'm going to tell the viewers and the readers maybe some places they should avoid. Nobody's talked about health care, and although health care costs have begun to slow as a percentage of total economic growth and as a percentage of GDP, one of the things that's happened in 2014 and 2015 is that the actual consumer is paying a higher part of it.

Either because companies continue to cut benefits or because of the ACA [Affordable Care Act], Obamacare, co-pays are higher. And people actually pay more out of pocket. That is having an impact, and it's going to have a political impact, of course, on 2016 as well. I think the days of real easy unit and pricing growth in health care may be behind us, and those are very elevated prices right now.


**So who is the most affected by that? Is that large pharma? Is that biotech?**

**CHANOS:** Anybody that's been dependent on raising prices aggressively as their business strategy is going to be under a microscope, we know that. And I think that, increasingly now, people are going to look at the downside of the ACA. We were short health care in 2010 going into the [passage of Obamacare]. I wasn't smart enough to go long; we didn't see it was going to be an immense positive for the industry going forward. Those days, the easy growth days, are behind us now, and now we're beginning to see some of the negatives.

**PAREKH:** Just to echo Jim's point, I'll give you a 30-second story: I had to have an MRI, and it turned out that the insurance company called me and said if you go to this provider, it's \$900. If you go to this provider, it's \$3,000. Would you mind going to the first provider? They were 10 blocks apart. I said, "Why should I do this?" Because in this case, I had no co-pay. He said, "Because this is the only way we're going to reduce the cost of health care." Which is an unbelievable answer from somebody from a call center.

But this is all because of technology. And that MRI was booked the same day. And so I think that effect, the pricing transparency, technology, is going to come to almost every market.

**Thanks, everybody.** ■



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# THE TECH EMPIRE BUILDER

**Nikesh Arora** helped Google become a profit machine. Now, as SoftBank's larger-than-life CEO-in-waiting, he's investing heavily in startups around the world. Can he turn the Japanese telecom giant into a tech Berkshire Hathaway?

A SELFIE SWARM comes on gradually, as I learned when I joined Nikesh Arora at a recent conference in Bengaluru, India. It starts when one shameless fan asks to take a selfie, so the subject obliges, and then another squeezes in, and another, until tens, maybe hundreds of eager people engulf him, arms outstretched, smartphone cameras aloft. The swarmed subject now has a choice: He can push through the jumble of bodies, phones, and smiles, rejecting the simple appeal—it's just a selfie! Or he can do what Arora does: pause and look up at his image in the sea of phone screens until handlers extract him from the swarm. People follow, calling out "Nikesh!" but the handlers are firm. "Nikesh has to leave," they say. "Another time, please."

By  
**ERIN  
GRIFFITH**

Photograph by  
**BENJAMIN RASMUSSEN**



Arora isn't a movie idol or a YouTube star—he's a tech executive, and one whose name most Americans wouldn't recognize. He didn't encounter this sort of reception in San Francisco, where he had spoken at TechCrunch Disrupt a month prior, or in New York City, where he addressed a Goldman Sachs gathering. At such events he's treated with a mixture of respect and curiosity, as you'd expect for someone who helped turn Google into a behemoth and then left it, not for a CEO job, not to business-ify another up-and-coming Silicon Valley company, but to make investments at SoftBank, an enigmatic Japanese telecom conglomerate.

But in India the swarm follows him just about everywhere he goes. There he's like Elvis—the Elvis of business. Arora can crack jokes about Indian culture in Hindi in one breath and warn startups about their addiction to “OPM” (other people's money) in the next. He's one of the business elite known in his country as a “global Indian,” a group that includes the CEOs of Microsoft, PepsiCo, and Google. But a few traits set him apart from those executives. His compensation is higher—\$135 million in 2014, counting his signing bonus. His lifestyle is flashier—Ashton Kutcher and the Jolie-Pitts attended his lavish 2014 wedding to Indian real estate scion Ayesha Thapar. And, most important to entrepreneurs, he's visiting his homeland with a fat checkbook.

Armchair investors love to parrot the line “India is the new China,” but few have put as much money to work there in so splashy a fashion as SoftBank. In the year and a half since Arora left a top spot at Google to join the company, SoftBank has invested more than \$1 billion in the country's hottest startups, including Oyo Rooms, Ola Cabs, and Snapdeal—strong contenders to be, respectively, the Airbnb, Uber, and Amazon of India. It's all part of SoftBank's hunt for the next humongous, growth-driving tech business, coming on the heels of a stellar run of venture investments in China. The frenetic pace of their investing has earned Arora and SoftBank a royal distinction among India's entrepreneurs. Before he joined, SoftBank made big bets in a few places, Arora says. “Now we're making a lot of bets in a lot of places.”

At 47, tall, with a broad-shouldered frame, sharp features, and an easy smile, Arora comes off simultaneously as a jovial, backslapping uncle and a prickly, daunting power player. He's fond of recounting his beginnings: He came to the U.S. for business school in 1990 with \$3,000 and a suitcase. Determined to outperform a classmate who had laughed at him for wearing white socks with a suit, he graduated top of his class at Northeastern University in Boston. Twenty-five years later he has risen to the top tier of the business world,

## SOFTBANK'S GLOBAL UNICORNS

Nikesh Arora has invested nearly \$4 billion since he joined SoftBank in 2014. Here are the most valuable startups in his portfolio.

GRABTAXI  
SINGAPORE

\$1.7  
BILLION

SOCIAL FINANCE  
U.S.

\$4.5 BILLION

COUPANG  
KOREA

\$5 BILLION

OLA CABS  
INDIA

\$5 BILLION

SNAPDEAL  
INDIA

\$5 BILLION

DIDI KUAI  
CHINA

\$16.5 BILLION

hobnobbing at Davos and Sun Valley, counting leaders of both the old guard of Silicon Valley (Jerry Yang and Larry Ellison) and the hoodie generation (Ashton, of course, and Snapchat CEO Evan Spiegel) among his friends.

But as the anointed future CEO of SoftBank, he faces challenges that stretch beyond Bengaluru (a.k.a. Bangalore). Arora is best known for whipping Google, a freewheeling young business, into a disciplined organization that scaled like crazy—and for doing it with a no-nonsense approach that bulldozed opposition. No company needs that kind of focused attention more than SoftBank, whose sprawling, confusing network of holdings includes everything from a Japanese pro-baseball team and a struggling U.S. telecom to a huge share of Chinese e-commerce giant Alibaba and a personal robot named Pepper. Alongside founder and current CEO Masayoshi Son, Arora is trying to help SoftBank evolve into a global, tech-focused Berkshire Hathaway. “[Son] has never had a problem taking big bets,” Arora says. “What we have to do now is take that genius and figure out a way to at least institutionalize some of his values, so the future generation of SoftBank can actually execute in the same way that he does.”



SoftBank CEO Masayoshi Son [right] says Arora is "already acting as my counterpart and my partner."

Arora's new gig also presents obstacles he has never encountered before. Without ever having worked in venture capital, he's now one of the world's most visible and free-spending VCs. For the first time, he's leading a company that faces a suffocating debt load and deep investor skepticism: SoftBank's publicly traded holdings in Sprint, Alibaba, and Yahoo Japan alone are worth \$22 billion more than the parent's entire market cap (more on that later). His

boss and board do business in a language he barely speaks. And he's pouring huge sums—almost \$4 billion so far—into highly valued, late-stage startups just as other investors, notably Fidelity and other mutual-fund giants, are becoming more cautious.

He's figuring things out as he goes. "Every job you get into, you bring 50% of the skills you need, and you learn the other 50% if you're lucky enough," he says. But to make it to 100% and to sur-

vive SoftBank's transition, Arora will have to win over investors with the same thing that won him the trust of Google founders Larry Page and Sergey Brin: irrefutable, home-run results.

**MASAYOSHI SON PUNCTUATES** confident declarations with a wide, mischievous smile at SoftBank's November 2015 analyst day in Tokyo. It's been 16 months since Son flummoxed the tech world by hiring Arora away from Google and six months since he promoted Arora to be his president, COO, and successor. A reporter asks if Arora is still the strongest candidate for the CEO job. Yes, Son says: He's relieved, because finding a successor has been the biggest pain in his neck.

Son looks over at Arora, sitting on stage next to SoftBank's board members and top executives. Arora is the only one wearing an earpiece to translate the event from Japanese into English; his expression is stern. Son tells the room that since Arora joined SoftBank, his feelings about the company have totally changed. Before Arora, Son later tells *Fortune*, he didn't have anyone to help him think strategically about the company. "Since he joined, I can have a high-level discussion for every angle around the future."

## HOW SOFTBANK BUILT AN IDIOSYNCRATIC EMPIRE



1981

SoftBank is founded as a packaged software distributor.

1995-96

It acquires trade show Comdex, forges a joint venture to launch Yahoo Japan, and buys *PC Magazine* publisher Ziff Davis.

1999

Founder Masayoshi Son acquires shares in 130 tech start-ups. Analysts estimate he controls 70% of Japan's Internet economy.

FEB. 2000

SoftBank invests \$20 million in e-commerce start-up Alibaba. Founder Jack Ma tells *Time*, "We don't even have a business plan."

MARCH 2000

The dotcom bubble pops. Between April 2000 and October 2002, SoftBank's stock falls 99%.

2005

SoftBank acquires a baseball team, the Fukuoka Daiei Hawks.

With almost \$80 billion in revenue in 2014, SoftBank is a complicated company with global reach. Arora proved he had the chops to run such an operation during an impressive decade-long stint at Google. At first his colleagues weren't sure he was "Googley" enough for a collaborative, engineer-heavy startup whose motto was "Don't be evil." Here was a slick marketing executive who'd been voted Most Likely to End Up on Wall Street by his business-school classmates. (He went on to work at Putnam Investments and Fidelity Investments, but only after numerous rejections and a stint teaching chartered financial analyst classes to Wall Streeters.)

He came in as vice president of Google's European operations in 2004, with big plans to expand that division from \$800 million in revenue to \$4 billion in five years. Meeting that target would mean demanding accountability from Google Europe's relaxed, collegial salespeople. They had been riding a rocket ship of growth but had no idea how much revenue they could expect to make each month, week, or day. Arora insisted on predictable, measurable results from his team, which he says "traumatized" them at first. He also talked co-founder Page into relaxing his famously centralized hiring protocol so Arora could staff up more quickly. Eric Schmidt, then Google's CEO, says Arora's moves signaled the start of a "federating" of Google as it transitioned from a U.S.-centric search engine into a global powerhouse. Google Europe hit \$8 billion in revenue in five years, doubling Arora's initial projection and increasing its share of Google's overall revenue from 25% to nearly 50%.

Arora also created analytics tools that spat out daily reports on the health of the European business, something the rest of the company eventually adopted. The tools helped Arora spot the 2008 financial crisis early, alerting the mother ship that something was amiss and enabling Google to adjust spending ahead of a slow quarter. That was invaluable,

Schmidt says: "After that I decided anything Nikesh wanted to do, I wanted to do as well."

Among the things Nikesh wanted, and got: He advocated killing Google's practice of giving commissions to agencies that worked with advertisers, a hardball move that prompted Martin Sorrell, the powerful head of advertising agency WPP, to label Google a "frenemy." (Arora says, "I will not pay you to bring me my existing customers," adding, "We never looked back.") He staged a Las Vegas retreat for 15,000 salespeople—uncharacteristically flashy for Google—where he donned an Elvis costume for his speech. He warned employees that he would personally bail out anyone who got arrested; nobody liked the idea of a jailhouse visit from Arora, so none was required. Arora hadn't become Googley, colleagues say, but Google had become more like him.

In 2010, Arora relocated to Mountain View, Calif.,

to become chief business officer, responsible for Google's entire \$29 billion in revenue. His pay package, higher than that of the founders, became as legendary as his temperament. Employees and outsiders regarded him with a mixture of awe and fear, describing him as ruthless, brash, and sharp. (Arora admits he may have been "insensitive" and "less patient" back then.) When I ask Andy Rubin, founder of mobile operating system Android, whether Arora was intimidating, he quips, "You mean the guy that's in charge of all the money coming into the company? You have to kinda listen to what he says."

Minutes into our first meeting, Arora tells me how my story will go. "You'll learn a lot of stuff, you'll decide to write some of it and decide not to write some of it," he says. "I have some enemies, as you will discover. I don't suffer fools. In fact, I'll be surprised if you don't find any." Enemies were

HAWKS: YUKI TAGUCHI—WB/C/MLB PHOTOS VIA GETTY IMAGES



2006

SoftBank wins bidding war to buy the Japanese arm of Vodafone for \$15.4 billion. It becomes Japan's most profitable telecom.

2012

Son buys controlling stake in Sprint for \$22 billion. A plan to merge with T-Mobile is soon abandoned over antitrust concerns.

2014-15

SoftBank buys large stakes in fast-growing Asian startups, including Coupang, Snapdeal, Ola Cabs, Oyo Rooms, Grabtaxi, and Tokopedia.

2015

Pepper, SoftBank's emotionally intelligent robot, goes on sale in Japan.

found, but those who talked with *Fortune* all insisted I include the fact that Arora worked to win their respect. Take Michael Kassan, a prominent media consultant who worked on an antitrust campaign against Google in 2009. "When you're really good at something, you earn the right to be a bit of a peacock," Kassan says of Arora. "He could be a peacock." Still, he adds, "Nikesh and I started out as adversaries, and we became friends."

Google prides itself on encouraging differences of opinion—and in hindsight, as Arora admits, his opinion wasn't always right. Management didn't listen when Arora argued against buying Android, which now powers over 80% of the world's smartphones. After the deal, Arora emailed Schmidt, saying, "What's the point of asking my opinion if it's not going to matter?" Arora pitched management on acquiring Netflix in 2009, when it was worth less than \$3 billion (today it's at \$50 billion),

but he also led Google's failed bid to buy Groupon for \$5.75 billion in 2010—a bullet dodged. Still, Arora's successes far outweighed his misfires. Schmidt gushes that Arora is "the finest analytical businessman I've ever worked with."

Arora had chances to leave during his decade at Google. Yahoo and Skype discussed CEO roles with him, but when he looked at those assets, he says, he didn't see how he could fix them: "My view is if you take something, you gotta make sure you can succeed in it." But he did meet the person who would eventually lure him away. While pursuing a search deal between Google and Yahoo Japan, he got to know that company's chairman—Masayoshi Son of SoftBank.

Arora's 2014 wedding, billed by Indian gossip pages as "the Indo-U.S. business wedding of the century," wasn't just packed with celebrities. All of Google's top brass flew to

the Italian coast for it, including Page, Schmidt, and Brin. Two weeks later, the out-of-nowhere news broke: Arora was leaving Google for SoftBank. The only people in the tech community who didn't seem surprised were Son and Arora. As Arora tells entrepreneurs today, "Anytime you can predict your trajectory, you should change it."

**AT THE HEIGHT** of the dotcom bubble, Masayoshi Son had grown so rich on his tech investments that figuring out where to donate his billions had become a headache. By February 2000, SoftBank, the software company he founded in 1981, was worth \$160 billion, more than Toyota. For three days, Son was richer than Bill Gates. But then, as he likes to tell it, "God gave him a solution" to the money conundrum—SoftBank's shares dropped 99% as the dotcom bubble burst.

That wild stretch exemplifies the dizzying highs and dramatic lows that make SoftBank fascinating to watch—and a gut-wrenching ride for its investors. In 2006, SoftBank took on \$10.3 billion in debt to acquire the ailing Japanese arm of Vodafone, subsequently turning it into Japan's most profitable mobile carrier. And in one of history's most successful venture investments, Son wrote a \$20 million check to a tiny Chinese e-commerce startup called Alibaba in 2000. The stake is worth \$61 billion today. On the other side of the ledger there's Son's \$22 billion deal to acquire Sprint in 2012. The idea was to merge the U.S. telecom with T-Mobile, but that fell through, and SoftBank has been stuck holding the money-losing, fourth-place mobile carrier ever since. Investors have punished the company for it, with SoftBank shares down more than 25% since their late-2013 peak.

In the eyes of critics and fans alike, SoftBank is essentially a collection of Son's bold bets and high-stakes gambles, ranging from Sprint, Alibaba, and Yahoo Japan to Supercell, a successful Finnish gaming startup, along with a portfolio



WHAT'S THE POINT OF ASKING MY OPINION IF IT'S NOT GOING TO MATTER?" —ARORA TO THEN-CEO ERIC SCHMIDT AFTER GOOGLE BOUGHT ANDROID OVER ARORA'S OBJECTIONS



Arora and Schmidt [right] overcame their differences, and Arora helped the company become a global player.

of more than a dozen other subsidiaries. For many people who know the company, Son *is* the company. SoftBank has always been “just Masa,” says Sunil Mittal, CEO of Bharti Airtel, India’s largest telecom conglomerate, and a former SoftBank board member. “It’s Masa, Masa, Masa... That man has superhuman being in him.”

Son, 58, says he plans to retire sometime in his sixties, and he thinks Arora is the guy who can duplicate his magic. Arora’s initial mandate at SoftBank was to invest in Internet and media companies, but after just nine months Son promoted him to president and named him the likely successor. Now the two of them discuss SoftBank’s strategy almost every day. Arora became a “representative director,” a Japanese designation that means he can represent the company in

transactions, which Arora says “sent a signal internally that I was not just some foreigner who was going to run the international business.” Son views the CEO transition as a gradual hand off. “He’s already acting as my counterpart and my partner,” Son says. “Even after he becomes the CEO, I also have to support him in many, many ways.”

In a sign of solidarity, Arora in August bought \$483 million worth of SoftBank stock, alongside the company’s \$1 billion share buyback. It was a headline-grabbing move, but it’s Arora’s least favorite topic to be asked about. “It puts the focus on the wrong thing,” he says. Publicly, Arora has called the purchase both a bet on his company and a way to maintain his own appetite for risk, since it required taking on personal debt. Talking with *Fortune*, he explains it’s not actually that much of a risk, since he owns his house and cars and has enough money to send his kids to college. Worst-case scenario, SoftBank falls 50%, and he loses half of his principal. He can earn that back with his salary over the next few years.

SoftBank and Arora are buying shares at a time when the company is undervalued by many measures. The company’s holdings in publicly traded Sprint, Yahoo Japan, and Alibaba are worth \$84 billion—or \$22 billion more than SoftBank’s own

\$62 billion market cap. Even if you assign a 20% discount to those assets (typical for holding companies, given the taxes involved in selling the assets) and take into account SoftBank’s hulking debt, it appears investors are assigning no value to its \$38 billion telecom businesses, its controlling stake in the wildly profitable Supercell, or its booming portfolio of startup investments. (And don’t forget baseball’s SoftBank Hawks!) Jefferies analyst Atul Goyal has called SoftBank’s stock “grossly mispriced.” In August, a CLSA analyst declared, “The shares are just too cheap.” Of course, SoftBank’s debt makes many investors think it’s cheap for a reason: It’s carrying \$96 billion, a legacy of all those acquisitions, and SoftBank’s debt-to-equity ratio, at over 100, is staggeringly high. That didn’t stop Son from exploring a \$67 billion management buyout of SoftBank over the summer, according to reports; it would have been the largest buyout in history and, of course, inflated the debt load.

Arora suspects SoftBank’s stock is undervalued because of the struggles at Sprint, coupled with concerns about Alibaba and slowing growth in China. His big-picture job is to smooth out SoftBank’s performance while adding more transparency to its financial reports. He’s injecting more rigor into the company’s

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investment strategy, and cleaning up the portfolio with some divestitures. There are cosmetic fixes too, like adding the word “Group” to the company’s name in July to signify the new portfolio-of-tech-winners approach. If the transition is successful, investors will see SoftBank Group as a way to access the best high-growth tech companies around the world. Silicon Valley VCs like to boast that a basket of investments in startup “unicorns” (private companies worth \$1 billion or more) will outperform the S&P 500, even if some of them fail. SoftBank has actually created a global basket of unicorns—the company holds sizable stakes in six of them.

Right now, adding to that basket dominates Arora’s calendar. As chief deal doer, he lives in a jet, popping around the globe from SoftBank’s U.S. home base in San Carlos, Calif., hunting for new investments and checking on existing ones. (On the eight-day trip to India that I joined, Arora made five stops, darting from Delhi to Bengaluru, back to Delhi, to Mumbai, and to Varanasi for a college commencement speech.) Arora shut down SoftBank’s early-stage venture fund because he doesn’t want to compete with Silicon Valley VCs. Rather, he wants to invest in VCs’ success stories after they break out. So he’s writing big checks—all the way up to \$1 billion each for Korean e-commerce site Coupang and U.S. lending startup Social Finance. There are also the “Ubers of” Southeast Asia, China, and India, in which SoftBank has invested a respective \$350 million, \$600 million, and \$400 million. (For context: The average late-stage deal in North America in 2015 was around \$50 million.)

Arora has assembled a team of 15 to hunt for deals and advise portfolio companies, including former LinkedIn executive Deep Nishar, Baer Capital Partners founder Alok Sama, venture investor Marissa Campise, and ex-Google execs David Thevenon, Jonathan Bollock, and Liane Hornsey. Like Arora, Nishar and Sama were born in India, where SoftBank has been especially active and where the startup scene over the past year has turned white-hot.

**THERE IS A THICK** wooden door between Nikesh Arora and a sweaty mess of entrepreneurs and journalists. Arora has just delivered a keynote speech at Delhi’s TieCon entrepreneurship conference, peppered with Hindi jokes and advice that listeners should buck cultural pressure to “settle down”—his version of Steve Jobs’ “Stay hungry, stay foolish.” A trail of eager audience members has followed him across the Taj Palace Hotel like a Pied Piper of venture capital, only to find this door blocking their way.

Behind it, a select group of 20 entrepreneurs each get to

pose one question to Arora. I push my way in in time to hear Vani Kola, the venture capitalist who organized the meeting, tell the founders how lucky they are to spend time with Arora. There are selfies inside too. Arora furrows his brow at one fan’s clunky Nexus 4. “Get a new phone,” he says. “You’re a startup founder. You need to know the latest.”

Around the time Arora joined SoftBank, Masayoshi Son decided that India was the next big growth opportunity, and Son tackled investing in the region in his usual swashbuckling style. He approached Kunal Bahl, founder of fast-growing e-commerce startup Snapdeal, with an unheard-of offer to invest \$1 billion for a majority stake. “Don’t worry about your board,” he told Bahl. “Just take the money.” The board, unwilling to give up so many shares, turned him down.

Arora had to explain to Son that business doesn’t work like that in India, where it’s important to develop a sense of trust and personal partnership with investors. Then Arora spent three weeks convincing Snapdeal to let SoftBank invest. The board agreed, on a smaller scale—\$620 million for just over 30%. Bahl says Arora was “absolutely critical” in sealing the deal: “He was able to make [the investment] real and highly substantiated, and give comfort to our existing shareholders.”

Arora and Son returned to India a few months later for a whirlwind, coffee-fueled series of meetings with 43 entrepreneurs over two days. They picked two more companies to back: real estate site Housing.com and Ola Cabs, the Uber of India. Later they gave \$90 million to the 22-year-old founder of Oyo Rooms, a budget hotel startup. Now SoftBank, previously little-known in India, gets named in the same breath as DST and Tiger Global, the two most active late-stage dealmakers there. “You can write a check, and we can tolerate you,” says Kola, a Snapdeal board member through her firm, Kalaari Capital. “But goodwill is something that has to come from the heart, and that is something [Arora] has done.”

**AS HE NAVIGATES** India, Arora seems delighted to be back, donning a Nehru jacket while other male executives wear Western-style sport coats. On the trip that *Fortune* joined, he left an event’s dinner early after seeing the menu. “They’re not even serving Indian food!” he explained in near disbelief. “When I come to India, I want to eat Indian food.”

At SoftBank’s portfolio companies, Arora says, he’s instilling long-term, Masayoshi Son-style thinking. He asks young executives to plan for a 10-year horizon, while teaching what he learned about scaling a web business at Google. Arora has personally interviewed



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COMMERCIAL  
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# NIKESH ARORA ON SOFTBANK AND MASAYOSHI SON

“What we have to do now is figure out a way to institutionalize some of [Son’s] values so the future generation of SoftBank can actually execute in the way he does.”

CFO candidates for three portfolio companies, and his partner Nishar has helped recruit top execs for several others.

Arora is also forging connections within SoftBank’s portfolio. He introduced Snapdeal’s Bahl to Alibaba founder Jack Ma, which led to Alibaba investing in Snapdeal. Now the two companies share insights—Alibaba execs advised Snapdeal to build more technology for their sellers, for example. Likewise, Didi Kuaidi, the Uber of China in which SoftBank and Alibaba are both large shareholders, recently invested in Ola Cabs. Arora is at the center of this web, and portfolio company CEOs are effusive in their admiration. “He’s more like a friend than an investor,” says Bhavish Aggarwal, CEO of Ola.

When Arora meets with founders, he knows what he wants to discuss, and it’s probably not on the CEOs’ PowerPoint deck. “You get two slides in, and he’s off on another thing,” says Kunal Shah, who sold his payments company, FreeCharge, to Snapdeal in April. Arora says that’s a test: Any founder who insists on walking you through every one of his slides isn’t adaptable enough to change course at a startup. He doesn’t get into granular tactical advice, like how much to spend on advertising, but if he did, he’d probably tell founders to cool it. During the October trip, his warnings about out-of-control spending made headlines in India’s biggest newspapers—though not on the front pages, because those were covered by massive Snapdeal ads.

There are limits on how much SoftBank will pay in its deal frenzy—in the U.S. or abroad. Arora passed on joining a funding round that valued Snapchat, the hot messaging app based in Los Angeles, at \$16 billion. To double SoftBank’s money—a weak return in venture capital—Snapchat would have to go public at \$32 billion, and Arora is skeptical that Snapchat, which expects \$100 million in revenue in 2015,

could justify that price.

Yet even without investing, Arora has given Snapchat a boost. When CEO Evan Spiegel was preparing to meet potential advertisers for the first time, he went to Arora’s house to show him a presentation he had made on loose-leaf notebook paper. Arora flipped through the pages, turned the notebook over, grabbed a Sharpie, and drew up a plan for what Spiegel should *actually* do, from simple things like asking to use early ads in case studies to big-picture sales tactics. “I probably came off like a 12-year-old,” Spiegel says. “He’s been really honest and direct with me... about the reality of building an ads business.”

The drive to teach and shape entrepreneurs energizes Arora, and it comes with a heavy sense of responsibility. Yes, the potential returns on SoftBank’s investments are huge, but it’s important to Arora to believe that they’re also the right strategy. Doing something for the wrong reasons, he says, goes against how he was raised. When he was young, his father, a judge advocate general in the army, was transferred to a faraway city for three years because he took a stand against a higher-up at work. That lesson on sticking to one’s principles is “somehow subconsciously deeply ingrained in me,” he says.

His father now suffers from ALS; during this visit to India, he’s in the hospital, and Arora’s voice briefly wavers as he talks at a small dinner gathering about his father’s strong will. It’s the only time in a week’s worth of public appearances that a crack shows in Arora’s larger-than-life public persona.

But such moments of vulnerability are brief, especially since the public is always waiting. After an awards event in Bengaluru, Arora finds himself pulled in front of a videocamera with a giant boom mic and blinding light. A crowd of reporters, entrepreneurs, and hangers-on assembles until there are several rows of people waiting to meet him, ask him a question, push a business card into his hand. As he walks toward his next engagement, three photographers with loud paparazzi shutters surround him with clackclackclackclacks. Arora is talking with Kola, the Snapdeal board member. They are trying to find a time to meet; they settle on the car ride between Arora’s speaking engagements the next evening. His entourage takes a few steps and then must stop and wait, because more reporters and entrepreneurs and hangers-on have approached Arora, writing down what he says, handing him business cards. He is the center of attention. This must be home. **F**

# Preemptive Outsourcing

IT services company **Virtusa** takes a holistic, next-gen approach to **IT outsourcing**. And it's working.

**O**VER THE LAST 15 YEARS, the global outsourcing sector has grown exponentially—it's now a \$104 billion industry, up from \$45 billion in 2000, according to Statista, a company that aggregates industry data—yet there's one issue that could be preventing even further expansion: a lack of satisfied clients.

That's the point of view of Harsha Kumar, senior vice-president of outsourcing transformation services at Virtusa Corporation, a Westborough, Mass.-based global IT services company. "When we talk to clients we find that there's dissatisfaction with IT's ability to support business agility and adequacy of application performance," he says. "They're surprised. Expectations are high, since the whole point of outsourcing is to focus on these core competencies."

A 2013 study by Alsbriidge, an Addison, Texas-based sourcing company, surveyed senior IT professionals in Europe and found that 26% were unhappy with at least one of their IT outsourcing contracts, while 76% were considering renegotiating two or more deals. The reason for that unhappiness had to do with a number of factors, including not keeping up with changing technology needs, too-high expectations from the contract, and complacent suppliers.

Another reason for outsourcing operations problems is that the model has long been reactive, rather than proactive, says Kumar. In other words, when an IT issue arises, a ticket is generated, then resolved. Every setback is isolated—companies fail to look at the big picture—and this causes a "technical debt," a term to describe how clean one leaves a system after touching it. A reactive model leads to an increasing technical debt, says Kumar, even though the IT team may be eager to please. "Every subsequent ticket is then harder and harder to resolve and things go from bad to worse," he says. "That's the key problem."

To handle this Kumar suggests a four-pronged, 'pre-emptive' approach, which includes monitoring, agile DevOps, automation, and re-engineering. The idea is to use these methods, which employ predictive analytics, to solve a problem before it happens.

When it comes to monitoring, Virtusa's solutions allow companies to review and monitor applications



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—HARSHA KUMAR, SENIOR VICE-PRESIDENT OF OUTSOURCING TRANSFORMATION SERVICES, VIRTUSA CORPORATION

efficiently. An example would include monitoring of data points on their servers to effectively predict when an application might slow down. Its "agile DevOps" strategy involves accelerating cycle times to update software by leveraging continuous integration and continuous deployment techniques.

Taking human error out of the equation by automating technical support is important, too: Automation fixes problems more quickly, allowing teams to focus on new feature development to support new market opportunities.

Finally, being preemptive also involves "re-engineering." Instead of just fixing a ticket and leaving it at that, Virtusa's analysts cluster similar tickets together for an engineer who then looks more closely for a pattern. If necessary, he then re-engineers code. As a result, client churn rate is extremely low. The more issues the company can solve before they become big problems, the happier people are. "We're leading the way with this preemptive approach," Kumar says. "When you put it all together, you see a lot of satisfied customers." ●



For more information on Virtusa's Outsourcing Transformation Services, scan the QR code.



# Private Equity's Paper Tigers

These elite funds style themselves as the alpha predators of the investing jungle. But a close examination suggests their fees are the only things with bite.

By ROGER LOWENSTEIN

WITH 2015 SHAPING UP as the worst year for investing since the Great Recession, investors are wondering where to turn. Stocks? They had a tumultuous and disappointing year. Bonds? Credit concerns multiplied, and spreads widened. Oil or other commodities? Fuggedaboutit. For many

investors, institutions in particular, private equity beckons as a singularly soothing and lucrative safe haven. PE managers, the promise goes, protect your assets from the volatility wrought by a teetering China or a skittish Federal Reserve.

Illustration by FRANCESCO BONGIORNI

And thanks to the managers' adroit dealmaking and operational wizardry, returns magically outpace those in the stock market. No wonder private equity is increasingly the "alternative" of choice. Public pensions now have a tenth of their assets in these private and opaque vehicles; some endowments have much more.

Buoyed by uncommonly low interest rates, the industry has boasted of double-digit returns; the past few years, at least anecdotally, have been especially rich. "We've been waiting for big news from the PE industry for almost five years, and 2014 delivered," exults a 2015 report from Bain & Co., an industry consultant, which goes on to tout the \$456 billion in "exits"—cash redeemed from the sale of companies formerly held by private equity funds. It was "a year for the record books."

I've always been uncomfortable with the Panglossian cheerleading that has surrounded private equity. Although the name has changed, it's still the same industry once denoted as "leveraged buyouts"—that is, the business of buying companies with a thin slice of nonpublic equity and mountains of debt, in which fund managers grab richly generous (to themselves) fees. In theory the funds provide managerial expertise, improve the underlying

businesses, and cash out—usually within three to six years. Until they do, investors rely on managers' estimates to gauge their results. (That's because PE is, indeed, "private"—there is no centralized reporting or standard index of returns.) Then there is all that debt, raising the nagging suspicion that the secret sauce, if one exists, of successful PE firms isn't managerial competence but leverage.

I have wondered, too, whether the designation "alternative" is really appropriate. Are companies truly different by virtue of having private rather than public stock ownership?

At the very least, more reliable data has started to close the information gap. Public pension funds are required by the states in which they are domiciled to report on their PE holdings. Firms such as Cambridge Associates and Preqin have compiled returns from individual investors (generally known as limited partners, or LPs). The data is increasingly inclusive; moreover, since it derives from investors rather than fund promoters, it is less likely to be tainted.

And the data is pretty unambiguous. Over its now three-decade-plus history, PE outclasses the stock market (or at least the Standard & Poor's 500) by about three percentage points a year. The edge is clear.

Or is it? What has really happened in private equity over those decades is that investors, net of fees, did about 25% better than the S&P up through the 2005 "vintage" year (denoting funds that first drew capital in 2005). But PE performance in the 2006 through 2010 vintages, tracked through mid-2014, has been running on par with the S&P.

That's a stunning finding. It means that since 2006, this touted "alternative asset class nonpareil" has actually been mediocre. The conclusion comes from a soon-to-be-published paper, "How Do Private Equity Investments Perform Compared to Public Equity?" by Robert S. Harris, Tim Jenkinson, and Steven N. Kaplan. Kaplan, who is at the University of Chicago's Booth School of Business, is probably the foremost private equity scholar in the galaxy. (Harris is with the Darden School of Business at the University of Virginia, and Jenkinson is at Saïd Business School at Oxford.)

Kaplan, in the past, has been positive on the industry, but he bristled when I called him a PE supporter. "I report what I find," he told me. And what he and his colleagues find is that "post-2005 vintages have been roughly equal to public markets." The trio relied for their data on Burgiss, a Hoboken, N.J., firm that provides support services to institutional investors and has turned its database into an ersatz index of limited partnership performance. The Burgiss data includes nearly 300 investors and some 1,800 funds (roughly split

among private equity and venture capital) in North America alone.

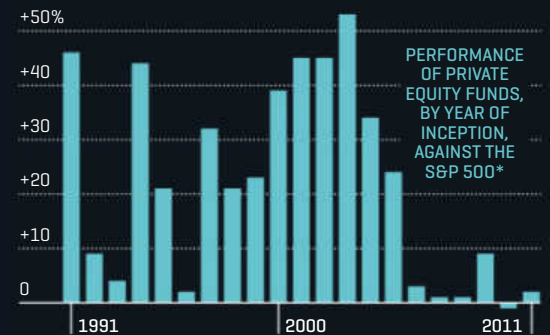
While no one else has compiled such a comprehensive and critical study, supporting evidence has crept into the literature. In its 2015 PE report, published early in the year, Bain commented, "A disquieting concern lurks just beneath [PE's] shining surface." Relying on Cambridge data, Bain found that U.S. buyout funds underperformed a public market equivalent over one and three years, and merely matched it over five. Bain concluded, "PE's continued ability to outpace public market gains over the long term can no longer be taken for granted."

Given that the Harris-Jenkinson-Kaplan study, which will be published in the *Journal of Investment Management*, has been available online, it seems strange that hardly anyone has noticed. But money continues to pour into PE funds. As of 2014, they manage \$2.6 trillion in assets and are sitting on another \$1.2 trillion of "dry powder," that is, capital committed but not yet invested. (The figures include those for venture capital funds. While VC is best thought of as a distinct business, figures for it and PE are often lumped together.)

According to Kaplan, historically PE has been least

## PRIVATE EQUITY FUNDS RUN OUT OF STEAM

Since 2006, private equity funds, on average, have largely kept pace with the S&P 500, according to research by Steven Kaplan, at the University of Chicago's Booth School of Business, and colleagues. That's a far cry from their heyday in the 1990s and early 2000s.



\* Based on the Kaplan-Schoar public market equivalent (a measurement of performance) of private equity funds from each vintage year, or when they first drew capital. Data is drawn from nearly 800 funds.

successful when investment capital is in ample supply. And at present, PE funds are choking on cash, driving up prices of potential targets. LPs as well as fund managers describe an auction environment in which targets are going for near-record multiples of cash flow. "There are certain sectors we used to invest in where we no longer do," notes Ben Cukier, a founding partner at Centana Growth Partners, which specializes in PE investments in financial services and enterprise technology. "There are no cash flow multiples because [some] companies are losing money." Adds a dealmaker in New England: "Right now we are back to where we were in 2006. It feels pretty frothy." Consistent with such comments, capital commit-

ted to PE funds has lately been at its highest level ever relative to stock market capitalization, save for the pre-crash year 2007. It amounts to "wind in your face," Kaplan says, "which is what we have now."

Industry advocates, while not denying that relative results have tapered off, stress that private equity is not monolithic. Some fund managers are more talented than others; some are more nimble or invested in more fertile terrain. (Indeed, *before* fees, PE funds overall have beaten the S&P by a healthy margin, which suggests either some prowess on the part of their managers or, perhaps, the effect of leverage.) Boosters suggest that this is something that investors can know *a priori*. For example, PE data provider Preqin counsels, "By choosing the best-performing fund managers, investors can generate premium, long-term returns."

Ah, wouldn't we all love, retrospectively, to pick the best of anything? If only it were so easy. Adding to the challenge is that so-called persistence—the tendency of a PE firm's past results to be predictive going forward—has plummeted, according to academic research. Gary Pinkus, North America managing partner at McKinsey & Co., says investors should look for funds with specialized capabilities, but as a McKinsey report under his name admits, "Track record is no longer a reliable indicator." Echoes Kaplan: "It's hard to tell what the good funds are."

What the anecdotal evidence and various research studies

describe is a picture of a maturing (or mature) industry. As with hedge funds, early returns were achieved by a pioneer group with apparently exceptional talent. The high management and profit-sharing fees may even have been deserved. As more players entered the game, it was inevitable that average competency would veer toward the mean. And even if every PE firm were imbued with genius, the mere fact that the field is so crowded would drive up deal prices and depress returns. Today an estimated 2,250 private equity funds are hitting the hustings raising cash. In 2014, such funds hauled in \$177 billion, according to Preqin.

While private equity has not suffered the embarrassment of the hedge fund industry, which has trailed the market since the start of 2009, the evidence suggests that PE now provides outsize rewards only to its managers. The returns for investors are ordinary. And that, importantly, would make it a worse investment on average than the stock market because PE is illiquid. If you can't earn a premium, why tie up your money for five, six, or more years?

So why do institutional investors and some well-heeled optimists keep falling for the pitch?

One selling point is the widespread perception that

private equity is less volatile than traditional market investments. PE firms re-value their assets only once a quarter, so on the surface it's far tamer than the stock market, a fact that institutional investors appreciate. What's more, PE firms tend to adjust their valuations cautiously. One insider told me, "In a down [stock] market, they are not marking to market"—perhaps an overstatement, but suggestive of the tendency to smooth results.

But it should be remembered that the underlying businesses owned by PE firms are not less volatile than other real-world companies. To distribute profits, PE firms eventually have to sell assets. At that point real prices—and volatility—cannot be avoided.

Each institution, of course, thinks its PE funds will outclass the field—but as noted, funds are operating in a turbocharged market. According to S&P Capital IQ, LBO prices in 2015 (through early October) were almost six times cash flow, close to the peak reached in 2007. Earnings coverage was better due to more stringent bank regulation and lower interest rates. But for the 10 largest deals, debt accounted for nearly two-thirds of the purchase price, far above the 50% level that prevailed in the cautious period after



"In the early days," says one private equity manager, "there was a very good alignment of investor and managerial interest. That's often no longer the case, as the biggest firms reap huge profits merely from their management fees."

the mortgage debacle. Make no mistake, the buyout market is bubbly. Even Bain refers to the "mountain" of capital chasing deals, resulting in "chronically high" prices.

Perhaps as a result of high going-in costs, PE firms are having to hold on to assets longer to wring out improvements. And they have all but ceased making the public-to-private deals that the industry was famed for. With stock prices so high, public firms are almost off-limits. Moreover, activist investors are pushing public companies to improve operations, eviscerating the rationale for buyouts.

PE firms, to be sure, have found new hunting grounds. Many are buying companies from other PE firms. There are even tertiary deals, in which operating companies are traded to a third fund. (Kaplan estimates that 25% of PE deals are PE to PE.) But think about this: If firm A buys a company ostensibly to engineer improvements, how many improvements will be left for buyout firm B (or C, or D)?

One seasoned private equity lawyer savvily points out that PE is a people business and that fund performance depends less on the brand name of the fund family than on the specific people managing the fund. Many big institutions, though, are too overwhelmed by the need to invest buckets of cash to pay close attention—and so much of that cash, in turn, now goes to giants as well. "It's salad days for KKR, Blackstone, Apollo," says Jonathan Grabel, chief investment officer at Public Employees Retirement Association of New Mexico, referring to the trio of titans in the PE realm.

It's a truism that as funds expand, it's harder for them to beat the market. It's more difficult, after all, to find smart, cheap investments for all that money. Less known, but equally true, is that managerial incentives shift as well. If you talk to people in the PE world, you quickly encounter the fear

that the largest firms are driven less by performance than by the hunger to gather assets. Management fees are so significant, Grabel says, that general partners often feel "a temptation to put money to work."

A PE manager in Boston told me something similar. "In the early days," he says, "there was a very good alignment" of investor and managerial interest. Managers covered their expenses with the fee—typically 2% of assets—and created wealth on the "carry," their 20% share of the profits. But as assets under management grew, the biggest firms could reap huge profits merely from the management fee.

This is true even as some funds have buckled under investor pressure and cut their rates. "There is a misalignment" of interests, Kaplan says. "With the very big players that's a real concern." One could say that private equity funds have, at least in their thirst for assets and their run-of-the-mill returns, begun to resemble grubby, conventional mutual funds. As an industry, mutual funds long ago dropped any pretense of beating the market. Can private equity be far behind? ■

*Roger Lowenstein is the author of the recently published *America's Bank* and a director of Sequoia Fund.*



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# SEVEN THINGS YOU NEED TO KNOW ABOUT CHINA

**China's slowdown has big implications for investors, but it shouldn't be the catastrophe that many have predicted. Here's what you need to know—and what Wall Street is getting wrong—about the world's second-largest economy.**

*By* SCOTT CENDROWSKI

ZHANG PENG—LIGHT ROCKET/GETTY IMAGES

**INVESTORS SEEKING** an upbeat indicator out of China probably missed this one in November: a Photoshopped picture of Jack Ma, chairman of e-commerce giant Alibaba, in a Tang Dynasty-era dress, wig, and makeup. Alibaba had persuaded customers to spend a record-smashing \$14.3 billion on Nov. 11 (Singles Day, China's answer to Black Friday). The Ma picture, which went viral on Chinese social media, represented a sort of coronation; its caption explained that Ma, never known for his dashing looks, was beautiful enough

to seduce China into a display of unprecedented consumerism.

That kind of joshing boosterism was hard to imagine when 2015 began. The year started with news that China's GDP growth in 2014 had fallen to a 24-year low (in 2015 it was expected to drop below 7%). A summer stock market crash, in which shares fell 40%, added fuel to the narrative that China was on the brink of a meltdown—a narrative that contributed to an ugly correction in U.S. stocks in August.

But that meltdown hasn't come. Industrial production keeps growing, if less rapidly. Real estate prices are rising. The stock market was up by a double-digit percentage for the year by November. And the consumers so persistently wooed by Ma look increasingly strong. Retail sales rose by double-digit percentages year over year in October, and Chinese provinces with large service industries reported GDP growth of 10% during 2015. Yes, when China sneezes, the global economy wheezes, but it seems less likely that the country will drag the world into recession—or capsize investors' portfolios—in 2016.

Doubts about China's future regularly “ebb and flow,” says McKinsey's Jonathan Woetzel, who has worked in China for three decades. He likes to talk about a book predicting an imminent China crash that he sees on display whenever he travels through Hong Kong's airport. It's a bestseller—and it's from 2001.

That's not to say there aren't reasons for anxiety. China's slowdown has hammered commodities and the energy sector, as waning demand depresses prices. Total government, consumer, and corporate debt, at 282% of GDP, is dangerously high: Michael Pettis, a finance professor at Peking University,

compares the potential corrosive effect of the debt to that in Japan, where indebtedness stifled innovation and hobbled the economy for two decades.

Another concern is the tenor of the country's politics. “Despotism is severely stressing China's system and society,” David Shambaugh, director of the China Policy Program at George Washington University, wrote earlier in 2015. Economic nationalism results in policies that hamper foreign companies' access to markets, expensive support of state-owned monopolies, and bailouts of the stock market—all signs of China's unwillingness to truly liberalize its economy (much less its politics) to unlock growth.

Still, China offers investors as much opportunity as uncertainty. Here's what really matters in the country's economy—the statistics, companies, and trends you should and shouldn't watch and worry about in the new year.



**Foreign Exchange**  
Apple sales in China doubled year over year in the third quarter of 2015, to \$12.5 billion.

## 1. Don't stress over China's stock markets.

They don't say much about the economy.

The screaming rise, crash, and rebound of Chinese stock markets in 2015 are evidence enough that the market is not a great indicator of the country's economic health. [As of late November, Chinese stocks as measured by the Shanghai Composite Index

QILAI SHEN—BLOOMBERG/GETTY IMAGES



were up 14% for the year.) Stocks make up only about 5% of household wealth in China, compared with a third in the U.S., and only about 8% of the country's people own stocks, so market swings don't affect regular investors that dramatically.

It's fairly normal [in China and elsewhere] for GDP growth and stock markets to be out of whack. For two decades through 2011, China averaged 9.4% growth. At the same time, according to a London Business School study, its stock market returned an annualized *negative* 5.5%. Then again, many China watchers don't trust official GDP figures either, noting that the government has an incentive to manipulate them.

What to watch instead? Some analysts like the Li Keqiang index, which relies on electricity usage, freight volume, and bank-loan growth to track industrial activity in China. It's named for Premier Li Keqiang, who once told a diplomat that it was his preferred measuring stick. It's worth noting that different versions of the Li index often yield numbers lower than the official GDP [see the chart on the next page for an example]. Other analysts track South Korean exports to measure the health of both Chinese consumers and heavy industry; the country ships a fourth of its exports to China.

2.

## Keep your eyes on China's consumers.

Their rise is the real story to watch in 2016.



IN BEIJING, twentysomethings wearing fake New Balance shoes, fake branded jackets, and no-brand backpacks squeeze themselves onto subway cars. Then they all stare down at their iPhones. It's a sign of what economists mean when they say China is "rebalancing."

Service- and consumer-oriented sectors make up half of China's GDP, compared with 80% in the U.S. The government is cheerleading for a transition toward consumer spending because the boom-time model of relying on infrastructure building and heavy industry for growth doesn't have a lot of steam left. When service industries replace manufacturing in a country, its economy needs 30% more jobs to produce the same unit of GDP, as Stephen Roach, former chief economist at Morgan Stanley, has written. That means more gainfully employed Chinese consumers can keep fueling growth in spending even if the country never replicates the big GDP numbers of recent decades.

The companies that capture consumer loyalties today could be winners in a decades-long transition. Apple's China sales increased 99% year over year last quarter, to \$12.5 billion. Nike's shoe sales are growing faster in China than anywhere else. Honeywell is supplying plane parts to meet boom times in Chinese consumer travel; the number of Chinese tourists traveling abroad is projected to rise from 116 million in 2014 to 242 million in 2024, says researcher CEIC Data.

3.

## A China slowdown doesn't hurt everyone.

These companies and industries could do well.



COMPANIES WHOSE BUSINESS aligns with Chinese government priorities should make money, come rain or 7% shine. One such priority: weaning the country from reliance on foreign semiconductors. China consumes 40% of worldwide chips and is spending \$20 billion a year to build its own industry. Counterintuitively, that could be a boon for a few foreign companies, including Cadence Design Systems and the U.K.'s ARM Holdings, says Northland Capital Markets analyst Gus Richard, because they license technology to dozens of Chinese chipmakers.

Another priority: health care reform. The government wants private companies to help combat the long queues and questionable service at state-run hospitals. Conglomerate Fosun recently bought one of China's best-known private hospital operators. Switzerland's Roche Pharmaceuticals is posting strong China sales for its cancer drugs, while Pfizer has benefited from the government's reliance on online and generic-drug sales to rein in costs. Even sports-gear makers may get a state-driven bump: The Communist Party wants more youth leagues and recreational teams. There could soon be 300 million basketball players in China, says Deutsche Bank analyst David Weiner, fueling growth for Nike, Under Armour, and Adidas. And President Xi Jinping's campaign to improve China's soccer program, which hasn't reached the World Cup since 2002, should also help Adidas.

4.

### Don't be distracted by foreign reserves.

The dollar's rise may skew the numbers.

FOR A WHILE in the summer of 2015, it appeared as though outflowing money might cripple China. The nation's foreign reserves fell by \$250 billion in the first half of the year, then by another \$137 billion in July and August—more than 10% of the total altogether. Nervous stock investors sold on the news in emerging markets and the U.S. But the most astute China watchers say falling reserves aren't always a sign of a crisis. In this case, the decline had to do with some businesses and wealthier individuals exchanging Chinese renminbi for dollars as the dollar continued its thunderous rise in value. When they stored those foreign assets in their banks, they weren't counted in China's official reserve data—even though most of the money stayed in the country. As Emerging Advisors president Jonathan Anderson, a respected analyst, said at the time, "This is likely to be a cyclical phenomenon rather than a massive structural problem."

5.

### Real estate shouldn't make you nervous.

China's bubble issues are different from ours.

HOUSING AND COMMERCIAL construction account for 15% of China's GDP, according to Barclays, and real estate is among the biggest factors in the country's growth slowdown. In 2014 residential real estate values and sales flagged, and some Western investors predicted a Great Recession redux—with a housing bubble and related debt dragging the economy into the mire.

But that scenario now looks less likely. Chinese residential sales jumped in 2015, driving prices higher and inventories lower across 35 cities. The country's housing market is more or less walled off from the foreign creditors who pumped money into the recent U.S. housing bubble, so a crash precipitated by those investors yanking support is unlikely. A multiyear price decline could still hurt, but Chinese consumers also pay for a much larger share of their housing purchases in cash than Americans do, which means such a slump might do less damage to the overall economy.

6.

### Some U.S. companies will soon get hurt.

But some will cash in on a consumer boom.

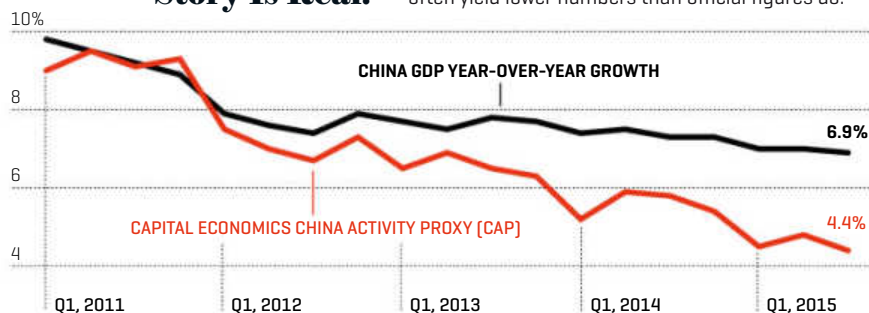
THE DIRECT EXPOSURE of U.S. companies overall to China is relatively small: It accounts for only 2% of S&P 500 revenue, says Goldman Sachs. But some companies have much more at stake in China. American producers of copper, aluminum, iron ore, and steel have been walloped by slowing demand. Coach is among the luxury brands whose revenues have been collateral damage in President Xi's political assault on corruption, since luxury gifts now risk being seen as bribes.

China's focus on homegrown technology could hurt big suppliers to business like Cisco, Microsoft, and IBM—all of which will face more onerous rules in order to keep operating in the country. Another victim of the homegrown trend: Tesla. The electric-car maker has so far been excluded from tax incentives that come with buying an electric car in China. Tesla sold only about 3,000 vehicles in China in the first three quarters of 2015, and China's state press reported in the spring that the company cut 30% of its employees there.

Some possible winners? Disney is opening a theme park in Shanghai in 2016, and ubiquitous Mickey Mouse T-shirts on kids and adults in China attest to the brand's popularity. Sun-Power is building Chinese solar plants for Apple. And General Motors' profitable trucks and SUVs are becoming big sellers in China.

### Which Growth Story Is Real?

Alternative measures of China's economic growth often yield lower numbers than official figures do.



GRAPHIC SOURCE: CAPITAL ECONOMICS

7.

## China's tech giants: They're not Apple. Don't expect them to take over the world.

TENCENT'S social network WeChat has 650 million users in China. But when Tencent brought it to the U.S. two years ago, it flopped. Alibaba has 350 million customers in China. It opened a shopping site in the U.S. called 11 Main—before giving up and selling it after a year. And how many in the West have ever used Baidu's search engine or a Xiaomi smartphone?

China's consumer-tech giants have healthy revenues and hefty valuations thanks to their huge, protected home market, but their struggles in the U.S. foretell a greater truth: They aren't going global anytime soon. Xiaomi offers one example of how a lack of tech innovation has hampered expansion. Its phones have taken off in China because of a distribution model that cuts out middlemen and allows rock-bottom prices. But after Xiaomi expanded to India in 2014, Ericsson won an injunction against the company for not paying patent royalties. (Xiaomi denied wrongdoing.)

The state's strategy of effectively shutting out foreign competitors may hurt Chinese consumer tech over the long term by sapping incentives to innovate. But for now it's helping fuel some awesome results. Tencent earned \$3.9 billion in 2014 on \$12.8 billion in revenue; Alibaba, \$3.1 billion on \$12.3 billion; and Baidu, \$2.1 billion on \$8 billion. In the short term, they've got upside for investors. Just don't assume they're anywhere close to expanding outside their home market.



### WHAT A CHINESE INVESTOR WORRIES ABOUT

Zhang Yuhui wears the comfortable black lace-up shoes and permanent smile of a salesman. Since the '90s, he's run his own steel-trading business. It sells the specialized varieties used in industrial machines from his hometown, Harbin, a provincial capital in China's north, built by Russians, whose skyline still sports the spiraled onion domes of an earlier time. Zhang is 45 and married, has a son, and, like his friends, is fretting about an economic slowdown. In other words, he is a typical wealthy Chinese investor.

Zhang's company's revenue peaked at around \$80 million in 2011, when it looked as if China's economy would grow at 10% a year forever. He says his friends took out large bank loans on that assumption. This year, with the industrial sector in recession, especially in the northern provinces

known as China's Rustbelt, Zhang is hoping his revenue reaches \$50 million. His friends have defaulted on their loans.

Like most Chinese, Zhang's chief investment is real estate. He doesn't have a savings account and hasn't trusted the stock market since he last owned shares, in 2000. Back in the mid-2000s, after Zhang spent \$400,000 on his first building in Harbin, it was easy to borrow against it for money to buy more. He now owns two villas, three shops, and five homes, worth about \$12.5 million. But real estate prices have declined by double-digit percentages over the past two years in Harbin. "Now the bank is calling all the loans," he says, and while his own finances are in good shape, "a lot of people are worried. To be honest, I worry like many people."

He has already sold a few properties and is undecided about what to do with the proceeds, which he's holding in cash. "The stock market is one choice," he says, explaining that he has been encouraged by its rebound from summer lows. Or there's real estate in the U.S. and U.K., which he calls "stable." And China's capital controls, which restrict moving more than \$50,000 abroad a year? "There are many ways around it," he says.

He's glum about his own business's prospects. "The shipbuilding industry is bad," Zhang says. "The auto industry has almost peaked. Maybe high-speed rail will grow in the next few years."

So he's making his next bet on consumer services. He recently opened a tea shop in Harbin that sells pu-erh tea [more expensive, ounce for ounce, than silver] for more than \$100 a sitting. Domestic tourism to his cold northern city will grow, he says; besides, people across China are still getting richer. Zhang says he doesn't want to miss China's next investing trend—a consumer boom. **TS**

#### Hedging Bets

Zhang hopes that real estate, including his tea shop, will see him through China's slump.

# These Canadians Own Your Town

You may have never heard of the Ontario Teachers' Pension Plan, but chances are it owns a big piece of your downtown and your local shopping mall—and even the roads you take to reach them. How an under-the-radar, top-performing investing team and its “Canadian model” revolutionized the way pension funds manage their money.

By CHRIS TAYLOR

CONSPIRACY THEORISTS have no shortage of ideas about who runs the world, which secret cabal is meeting in private to count cash and pull strings: the Bilderberg Conference, maybe, or the Trilateral Commission, or even Yale's Skull and Bones society.

But in investing, the answer isn't so sinister, nor is it even a secret. In fact, on this chilly autumn day, you can find a cadre of financial lever pullers walking the halls of downtown Toronto's Ritz-Carlton Hotel, clutching their morning cups of coffee and slipping discreetly into meeting rooms: the world's top pension-fund managers. Collectively the investors who gathered for the International Pensions Conference—among them, fund managers from the U.S., U.K., Canada, the Netherlands, and

Photograph by NIGEL DICKSON Illustration by DAVE HOMER



Japan—are stewards of \$2.5 trillion, a very significant chunk of the world's assets.

Circulating through this crowd is Ron Mock, head of the Ontario Teachers' Pension Plan. The avuncular, unassuming 62-year-old—"HOST CEO," his name tag reads—is moderating panels and introducing guest speakers; he also has the distinction of offering opening and closing remarks. Mock has a modest mien befitting a lifelong usher at Toronto's Maple Leaf Gardens arena. But among fellow pension managers, Mock might as well be strutting around like Mick Jagger. After all, he sits at the helm of a pension plan whose track record and revolutionary approach to investing have set benchmarks for just about anyone who manages a major endowment or pension fund.

Mock's Ontario Teachers' Pension Plan, widely known as "Teachers," manages a hefty \$154 billion Canadian (\$116 billion) in assets. It represents the collective savings of 129,000 retired Ontario teachers and 182,000 currently active ones. It's one of the most successful plans as well, with double-digit average annual returns since 1990, including an 11.8% return in 2014 (about four percentage points better than Canada's TSX index). Over the past 10 years, according to Toronto-based pension-fund analysis firm CEM Benchmarking, Teachers has placed among the top two performers in the world—out of 273 funds managing a total of \$8.5 trillion.

So what the hell is going on north of the 49th parallel? These unassuming investors have a secret sauce that has been so successful, for so long, that pension experts have dubbed it "the Canadian model." Canadian-model investing means minimizing passive stocks-and-bonds portfolios and buying sizable direct stakes—in companies, in infrastructure, in property. It also means running a pension fund as an independent business: no handing management reins to political cronies, no farming out research to expensive outside advisers. It means bringing in top pros and paying them handsomely, the better to keep them on board. And in Teachers' case, it means higher-than-average returns paired with lower-than-average risk.

Of course, none of this is any guarantee of success. And although you presumably don't have \$100 billion or more to manage, chances are that you and the Teachers team are grappling with some of the same challenges: the financial strain that comes with growing longevity, as retirement assets stretch to cover 25 or 30 years of living expenses; the difficulty of investing for a long time horizon in an investing climate that emphasizes short-term results; and the fact

that, after a six-year global bull market, too many assets are just too expensive. Indeed, Mock and his team are earnestly scouring this pension conference for new strategic ideas. "Market valuations are high, and there's a lot of capital chasing every opportunity," laments Jane Rowe, one of Teachers' top managers.

Still, the Teachers crew has every reason to believe that sticking to the method will pay off. "If you execute the Canadian model correctly—and there is 20 years of data on this—it is worth an extra 2% every year," says Keith Ambachtsheer, founding director of Canada's International Centre for Pension Management. "Compound that every year, and then look at your returns."

**PENSION EXPERTS** credit Teachers with originating this approach a quarter century ago, in 1990—before then the fund was little more than a collection of dusty provincial bonds. Since then Teachers has become the pacesetter for the industry, as more public-pension plans say, to paraphrase *When Harry Met Sally*, "I'll have what they're having." "The Koreans are doing it, the Singaporeans are doing it, the Dutch are doing it," says Larry Schloss, president of



Teachers' portfolio includes stakes in [clockwise from top left] such infrastructure projects as the U.K.'s Chunnel trains, the Chicago Skyway, and Copenhagen's airport; storage provider PODS; fashion line Hugo Boss; and the Ritz-Carlton hotel chain.

alternative-asset managers Angelo, Gordon & Co. and former chief investment officer of New York City's pension plans. "All the largest sovereign funds are trying to do it. The Canadians have figured it out—and they have the returns to prove it."

Ron Mock didn't invent the model—he joined Teachers in 2001 and took the helm on Jan. 1, 2014—



TRAIN: ANDREW FERRINGTON—GETTY IMAGES; SKYWAY: MICHAEL LOFENFELD—GETTY IMAGES; AIRPORT: EYES WIDE OPEN—GETTY IMAGES; PODS: GERALD MARTINEAU/THE WASHINGTON POST/GETTY IMAGES; HUGO BOSS: JOHN LAWSON—GETTY IMAGES; HOTEL: CHEN XIAOWEI—XINHUA NEWS AGENCY/EVEVINE/REDOX

but he's well aware of its influence. "Back in 2000 there were only a handful of players on the planet like us," says Mock, an electrical engineer by training who used to be in charge of safety at nuclear plants (no Homer Simpson jokes, please). "Now there might be 150 of them. People watched where we went and what we did, and suddenly our approach became very popular."

That popularity is forcing Mock and his colleagues to up their game. While Teachers used to be virtually alone among pension funds in scouring the world for innovative private deals, now it has serious competition. Trying to figure out those critical next steps: 1,100 Teachers employees,

many of them housed in a nondescript office building in Toronto's North End.

Mock is "very smart, he's very savvy, and he hires investment people who fit that mold," says Chris Ailman, chief investment officer for Calstrs, the \$181 billion fund managing the pensions of California teachers. "His real challenge is that he inherited a dynasty that has been successful for decades, like the New York Yankees. What do you do next?"

**TO GET A SENSE** of how far-reaching Teachers' strategy is, consider the myriad ways it might overlap with your daily life.

The next time you eat at an Applebee's or a Taco Bell, for instance, you may well be interacting with

Teachers, via its investment in the \$1.7 billion San Francisco-based franchisor Flynn Restaurant Group. If you go to a laundromat (Alliance Laundry Systems) or take your pet to an animal hospital (PetVet Care Centers) or buy a bag of kettle-cooked potato chips (Shearer's Snacks) or keep stuff in storage (Portable On-Demand Storage) or park your car in a pay lot (Imperial Parking) or go to the dentist (Heartland Dental Care) or buy a suit (Hugo Boss) or go the gym (24-Hour Fitness) or wear outdoor gear (Helly Hansen), you're crossing paths with Teachers' investments.

And that's just within the U.S. If you've ever traveled through airports in Copenhagen or Brussels, or Birmingham or Bristol in England, or taken the high-speed train connecting London with the Channel Tunnel, you've been sending a few bucks to Ontario Teachers. If you shop in any large Canadian mall, you're probably setting foot in part of a Teachers-owned real estate portfolio. Oh, and the Ritz-Carlton where I recently sat with Mock? Teachers co-owns that particular one, along with Ritz-Carlton itself, through Teachers' \$28 billion Cadillac Fairview real estate operations.

Of course, lots of portfolio managers can claim similar breadth. Many mutual funds, in both actively managed and index forms, have hundreds or even thousands of stock holdings. But few can claim the operational influence that Teachers has on the companies it invests in.

In a conversation in a Toronto boardroom, two of Teach-

## THREE KEY LESSONS FROM "TEACHERS"

The "Canadian model" portfolio of the Ontario Teachers' Pension Plan has delivered some enviable returns over the past 25 years. Of course, it includes a lot of assets that an average investor can't easily buy—including big stakes in privately held companies and infrastructure facilities like toll roads and airports, to name just a couple. But some of the principles behind the Teachers team's approach could be just as valuable to someone managing a college-savings kitty or a 401[k]. Here's how to let Northern Lights guide your portfolio.

# 1

### KEEP FEES TO A MINIMUM

Fees paid to outside advisers and fund managers have dragged down many pension plans' performance—which is one reason Teachers cuts outsiders out of its process. To minimize the impact of fees on your own savings, choose index funds and ETFs over actively managed funds; if you plan to hire a financial adviser, calculate whether you'll save money by paying an hourly fee rather than an annual percentage of your assets.

# 2

### HUNT FOR CASH FLOW

Canadian-model plans love a long-term cash stream. In November, Teachers and two other funds bought shares of the Chicago Skyway toll road, entitling them to inflation-indexed toll income—for the next 88 years. One way small investors can imitate that approach: Buying the ProShares S&P 500 Dividend Aristocrats ETF, which owns shares in companies that have increased dividends for at least 25 consecutive years. [It's currently paying a 2.7% yield.]

# 3

### WAIT FOR A CHEAP "SOFTBALL"

Reluctance to overpay has led Teachers' management to say no to some investing opportunities this year. Of course, investors can [and do] often disagree about what makes a given asset expensive. One metric that many investors like to use for individual stocks: five- and 10-year average price-to-earnings ratios. When a stock's current P/E ratio is much higher than the long-term average, it's a sign that shares have gotten overpriced.

ers' heaviest investment hitters walk *Fortune* through the fund's process. The two are very, well, Canadian. Mike Wissell heads Teachers' public equities investing, when he's not taking his kids to hockey practices or cheering Blue Jays games at the SkyDome. Jane Rowe, who runs the fund's private equity arm, has a boast-worthy track record—Teachers' private equity holdings have averaged annual returns of 19.7% since 1991 and are now valued at \$21 billion Canadian—but she's more likely to reminisce about Newfoundland and getaways to her cottage in Ontario's Muskoka region.

Still, as pleasant as they seem, Wissell and Rowe send a clear message that Teachers' money is not to be messed with. If the fund buys a stake in your private firm, they explain, it would like to help call the shots. No 5% or 10% slice, thanks; more likely it will shell out for 30%, 40%, 50%, or more. Oh, and Teachers will want a board seat. Did they mention that? "It's not unusual for us to have absolute control," says Rowe.

"That is very rare in the pension-plan world."

If Teachers takes a stake in your company, and it doesn't like what it sees, big changes may come and management heads may roll. When Teachers pushed McGraw-Hill to split up its business—well, it split up its business, in 2011. Teachers supported hedge fund rabble-rouser Bill Ackman in his battle with CP Rail, leading to the departure of CEO Fred Green in favor of E. Hunter Harrison

in 2012. The fund also objected to what it saw as excessive compensation of top management at Sprint Nextel, contributing to the replacement of CEO Dan Hesse by Marcelo Claure.

"It is the most proactive pension fund in Canada," says John Coffee, a law professor and corporate-governance expert at Columbia University. "It is activist—but hardly the most aggressive." Indeed, there's a marked difference in style between Teachers and many American activ-

ists: While the latter often take their campaigns public, making themselves part of the narrative, Teachers does its talking behind closed doors, says Ambachtsheer, the pension expert.

Teachers' managers insist they don't seek control for its own sake but in order to grow their business. And their successes show their impact. When the fund bought out vitamin giant GNC in 2007, it helped GNC expand into new markets and prepped the company for its IPO before selling out in 2012—having made five times its original investment. When it bought Alliance Laundry from Bain Capital in 2005, Teachers replaced the CEO and made key acquisitions—and has since scored a return of eight times its money. And when Teachers sold its 80% stake in Maple Leaf Sports and Entertainment, owner of hockey's Toronto Maple Leafs, it got a princely \$1.32 billion. Teachers had originally bought half the company, in 1994, for just \$44 million—building it into a powerhouse with additions like basketball's Toronto Raptors.

**OF COURSE**, assuming big stakes also means assuming sizable risks. "You won't meet anyone here who doesn't have some tragic investment story," admits Wissell. One stands out

in company lore: its very first private-capital investment, White Rose Crafts and Nursery Sales, bought in 1991 for \$15.75 million. Teachers foresaw grand things for the home-and-garden chain; it didn't foresee the hit the company would take from surging competitors like Walmart Canada and Costco Wholesale. Within a year, White Rose had folded. Laments Mock: "Bankruptcy right out of the gate."

Mock knows something about bouncing back from embarrassing adversity. After his stint at Ontario's nuclear plants, he earned an MBA and started working for the investment dealer now known as BMO Nesbitt Burns. Eventually he became head of a hedge fund, Phoenix Research and Trading. In 2000 the fund tanked, wiping out \$125 million in assets. Regulators found that a rogue trader was at fault for having amassed unapproved bond positions. Since Mock was head of the firm, though, the buck stopped with him. He was reprimanded by the Ontario Securities Commission for lack of oversight and was barred for years from becoming a public-company director or officer.

Given that car crash, it is perhaps surprising that Mock was hired the year after by Teachers. Commis-

sioned to steer its alternative assets, he rewarded the trust he'd been given by launching initiatives like Ole, a music-rights-management company that now owns the lucrative catalogues of artists like Rush and Timbaland. He was given the keys to the fund entirely in 2014, when he became the plan's president and CEO, with former head Jim Leech praising Mock's appointment as "outstanding."

"I learned a lot from that experience," Mock says of the Phoenix flameout. "People will be people. But you have to have a governance structure in place to prevent those things from happening. As the adage goes, trust—but verify."

**IN THE U.S.**, trust in public-pension programs is in short supply, and understandably so. Teachers is a fully funded plan, with enough cash on hand to meet 104% of its payment obligations. In comparison, the funding ratio for state and local pension plans in the U.S. is a worrisome 74%, according to Boston College's Center for Retirement Research.

Much of the U.S. shortfall reflects shortsighted decisions by governments to underfund their pensions, often in unfounded hope that sky-high investment returns would make up the difference. But critics say U.S. funds' performance also suffers from meddling in investment decisions by political appointees, from restrictions on the kinds of investment strategies they can pursue—and, often, from exorbitant fees charged by advisers.

When Teachers started stacking wins, other plans started following its lead, with the Canada Pension Plan (\$264.6 billion Canadian), the Ontario Municipal Employees Retirement System (\$72 billion Canadian), and the Caisse de Dépôt et Placement du Québec (\$225.9 billion Canadian) adopting similar philosophies. The Canadian model crossed the border as well. The Teacher Retirement System of Texas (\$132.8 billion), Calstrs (\$191.4 billion), and the Florida State Board of Administration (\$170 billion) have all been singled out for their maple-flavored approach.

But U.S. managers say they'd like to go even further in Teachers' direction. Hampered by traditional U.S. pension-fund rules, they feel as though they're in a fistfight with one hand tied behind their backs. Among the problems, they say, is relatively modest manager compensation. "The Canadian model pays their in-house team much closer to market compensation than their American counterparts," says Schloss, the former New York City official. "When I was CIO for NYC pension funds, I made \$224,000. Meanwhile, a first-year associate at J.P. Morgan right out of business school made \$300,000." In contrast, Mock made a cool \$3.62 million

▼ Teachers CEO Ron Mock (left) and Neil Petroff, executive vice president of investments, at the fund's headquarters in Toronto



Canadian in 2014, followed closely by executive vice president of investments Neil Petroff, who earned \$3.56 million Canadian, according to Teachers' annual report.

While some U.S. pensions stand out for Canadian-style independence, the model has proved a challenging transplant. "I fear that it will take a crisis, like the *Titanic* hitting the iceberg, before we do anything about it," says Calstrs's Ailman. "Until then we all just keep banging our head against the wall trying to make our current system work."

While publicly run American funds look on longingly, other funds have no such limitations—and that's where Teachers' managers are finding the stiffest competition. Mammoth university endowments like those of Harvard and Yale, and sovereign government funds from Abu Dhabi to Norway are all open to alternative assets and private ventures—and much more active in those spaces than they were when Teachers got started. And all of them share Teachers' ability to write \$500 million checks.

That's where Teachers hopes its 20-year headstart comes in handy. It already has tentacles all over the world, with outposts in Hong Kong and London expanding to enable more boots on the ground. In its hunt for cash flow, the fund is increasingly deploying those boots in infrastructure deals. Toll roads, airport services, high-speed trains? Count Teachers in. As Mock quips, "If you're selling an airport, I can get 15 people on a plane tomorrow."

The sector is decidedly unsexy, but it now makes up

\$12.6 billion of its portfolio. Infrastructure hits a sweet spot for managers who need to pay for teacher pensions 50, 60, or 70 years out. Like the utility or railroad properties in Monopoly, they may not be marquee venues—but they are consistent, under-rated revenue streams. Not long after *Fortune* met with Teachers' leaders, the fund announced a deal to buy a one-third stake in the Chicago Skyway, a toll road that accommodates some 17 million passenger cars a year. For \$512 million upfront, Teachers will get a share of tens of millions annually in toll income through the year 2104. The rationale is right out of Teachers' basic playbook: It's a "critical asset" that "will provide inflation-protected returns

to match our liabilities," says Andrew Claerhout, Teachers' senior vice president of infrastructure.

**THE SKYWAY DEAL** stands out for another reason: It's one of the few big buys Teachers has made recently. After years of rising prices, in assets from North American real estate to the Dow Jones industrial average, today's valuations make the fund's managers nervous. While Teachers declined to comment on which asset classes look intriguing, every interviewee brought up the flood of global capital chasing limited opportunities. You get the sense they are waiting for the fever to break and for prices to come back down to earth.

In the meantime they are doing bottom-up research, unwilling to overpay. "Our bosses always tell us we don't have to do anything," says Wissell. "It's okay to wait for the softballs." Finding softballs is hard work: That's why Jane Rowe just got back from Greenland, and Wissell from Brazil, as they scoured the globe for revenue streams. But no matter how far Teachers' managers travel, you can't take the Canada out of them. "We are very proud of the Canadian model," says Wissell. "But we don't scream it to the highest rafters. It's just not our way." ■

COLIN MCCONNELL—TORONTO STAR/GETTY IMAGES



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INVESTOR'S GUIDE 2016

PLAYING INTEREST RATES

# HOW TO FIGHT YOUR FEAR OF THE FED

Investors have been losing sleep over when and how much the Federal Reserve will raise interest rates. But some stocks and other assets could fare well no matter what the Fed does.

BY  
LAUREN SILVA  
LAUGHLIN

*Illustration by* JEFF HAN



**REMEMBER JUNE 2006?** Uber didn't exist; neither did the iPhone. Lehman Brothers was humming along, and rising housing prices were beginning to take what America thought would be a "breather." That month the Federal Reserve, chaired by a newbie named Ben Bernanke, bumped up the Federal funds rate 25 basis points, to 5.25%. It would be the last rate hike for more than nine years.

Since then a financial crisis has come and gone, and a jobless rate that reached 10% has fallen to 5%. But the funds rate—the Fed's principal lever for controlling interest rates systemwide—now sits close to zero, where it came to rest in 2008 as the Fed pumped up the economy. Investors, fearing the impact of a rate hike on stocks and bonds, are sweating bullets about when rates will tighten. Most believe the Fed will raise rates incrementally in mid-December (by the time you read this, it may have done so), but Fed insiders have offered zero clarity about what will follow, fretting

publicly about whether signs of a strengthening economy outweigh looming threats. The Fed “might [raise rates] 25 basis points and go away well into spring,” says Greg Valliere, chief strategist at Horizon Investments, a firm that manages \$2.4 billion. “It’s the most dovish Fed in our lifetime.”

“The persistence of the low-rate environment is not what people expected at the start of the year,” adds Russ Koesterich, BlackRock’s chief investment strategist. And that persistence is a problem for many money managers—indeed, a whole generation of investment pros was in college the last time rates went up.

Still, savvy investors can find guidance in history. Or so says Bob Johnson, president and CEO of the American College of Financial Services. With Gerald Jensen of Creighton University and Luis Garcia-Feijoo of Florida Atlantic University, Johnson recently surveyed the years 1966 through 2013 to determine which stocks perform best during which monetary-policy cycles; they published their findings this year as the book *Invest With the Fed*.

They concluded that trends in rates—up or down—are more important to asset prices than how much rates move. Right now, rates seemingly can only go up, which would

typically make this what economists call a restrictive period, when equities perform badly. But because the Fed has vacillated—it has “virtually no conviction around its move,” Johnson says—today’s environment is more akin to what he calls an indeterminate period, when Fed signals are mixed and rates don’t trend one way or another. Indeterminate periods, it turns out, aren’t rare. Roughly 17 of the 48 years covered by Johnson’s study qualify. Better yet: Johnson and his colleagues have identified stock sectors and asset classes that have performed well in such murky conditions.

*Fortune* took their research as a jumping-off point, looking at sectors that thrived in indeterminate years. Because history seldom repeats itself exactly—even Johnson acknowledges, for example, that today’s low rates are “unprecedented”—we asked investors which stocks in those sectors could do well in today’s particular economic circumstances. And we narrowed our search to sectors that also outperformed in rising-rate climates, in case the Fed turns unexpectedly hawkish. The result: investment picks that could hold up regardless of where rates go in 2016.

## Energy

**UNDER NORMAL CIRCUMSTANCES**, buying energy stocks today would be an easy call. According to Johnson’s research, energy is the best-performing sector during indeterminate rate cycles, averaging a 15.3% annual return; energy stocks also thrive when rates are rising, gaining 11.5% (see chart, opposite page). Both those rate climates correlate with a growing economy, which usually means more energy consumption. What’s more, energy companies generally do well in inflationary environments, says Dirk Hofschire, senior vice president of asset allocation research at Fidelity.

The problem, of course, is that the energy sector is anything but normal today. A slowdown in China and overproduction elsewhere have created a huge oil glut, sending crude prices and the stocks of energy companies plummeting. Dan Katzenberg, oil-stocks analyst at Baird Equity Research, estimates that the industry is producing 2 million more barrels of oil per day than the world is consuming. Still, he sees some encouraging signs: He estimates daily demand will grow by 1.2 million barrels over the next year; at the same time, U.S. producers have sharply cut production from its April 2014 peak. “That gets us pretty close” to equilibrium of supply and demand, he says.

Until then, companies that can keep their costs down will fare best in a cheap-energy world. Katzenberg likes



### THRIVING UNDER DURESS

Stocks in a handful of sectors have historically done well in both rising-rate and “indeterminate” climates; in general, stocks tend to struggle when the Fed is hawkish.

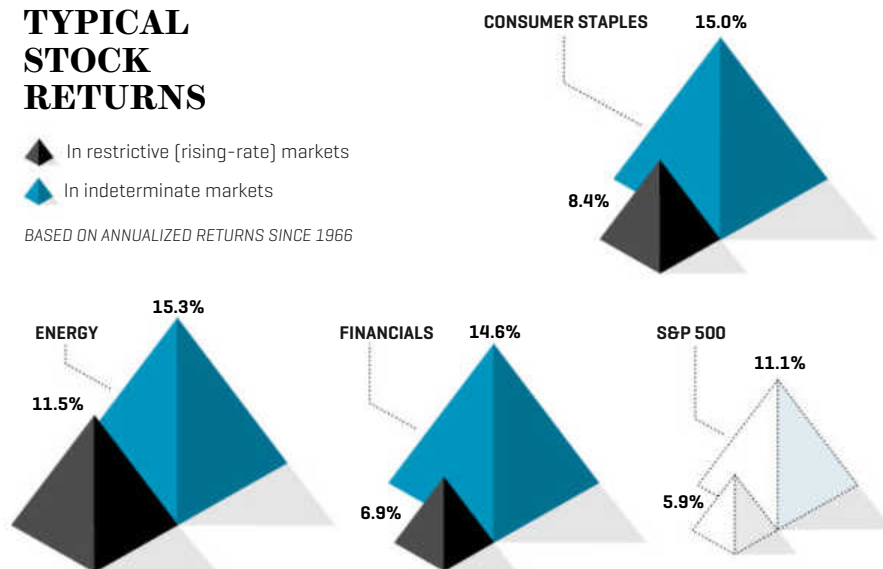
companies with “core shale acreage” from which they can extract oil and gas cheaply. He favors **Whiting Petroleum**, whose operations in the Bakken and Niobrara fields in the Great Plains fit that description. He thinks Whiting could be worth 44% more than its current price as it divests noncore assets. Katzenberg also likes **EOG Resources**, which has a strong cash position and low-cost reserves in Texas and the Rockies as well as the Bakken, and **Pioneer Natural Resources**, whose assets in Texas’s Midland Basin he sees as particularly valuable.

Chip Rewey, lead portfolio manager at Third Avenue’s flagship Value Strategy Fund, thinks that energy producers with strong cash positions will have an advantage if oil and gas prices stay low, because they won’t face pressure to ramp up production or sell off assets. Rewey singles out **Devon Energy** and **Apache Corp.**, both of which have net-debt-to-Ebitda ratios much lower than those of oil “super majors” like Chevron and Exxon Mobil. Both companies have the capability to be “profitable at \$40 oil,” Rewey says.

## TYPICAL STOCK RETURNS

 In restrictive (rising-rate) markets  
 In indeterminate markets

BASED ON ANNUALIZED RETURNS SINCE 1966



## Financials

BECAUSE BANKS and financial services companies earn more on deposits, loans, and other assets when interest rates are higher, investors assume they're great investments when money tightens up. But financials actually do better during indeterminate cycles, returning 14.6% annually, compared with 6.9% in rising-rate climates. One reason for that disparity: Investors often crowd into the stocks in anticipation of rising rates, so stock gains come before the rate hikes do. (Recent trading bore out that pattern: Between mid-October and mid-November, a basket of bank

stocks tracked by Bloomberg rose 6%.)

The best way to capture the financial-stock advantage in the current climate is to find companies that benefit disproportionately from even a small bump in rates. Rewey of Third Avenue likes **BNY Mellon**. With rates low, Rewey notes, BNY has had to grant fee waivers on money-market accounts to keep investors' returns positive. When rates climb, it can discontinue those waivers, adding 12¢ to 15¢ to its annual earnings per share for every 0.25% increase in the Federal funds benchmark. Overall, Rewey says, higher rates would boost BNY's earnings by almost a third. Another factor in BNY's favor: It has very healthy cash reserves, which will enable it to continue to support stock buybacks and dividends. Even "if the growth isn't there...economically they are returning capital," Rewey says. Once rates do rise, he thinks the stock could be worth more than \$60, a 37% premium to the current price.

Investment giant **Charles Schwab** has also been granting fee waivers to savers and should benefit when that practice ends. Mitch Rubin, co-chief investment officer of RiverPark Funds, which manages \$3.8 billion, says a 150-basis-point increase in rates over the long term would increase Schwab's earnings by 50%. (For more on the case for Schwab, see "Good Stocks for Bad Times" in this issue.)

## Consumer staples

COMPANIES THAT make and sell basics like diapers, shampoo, and groceries can often sustain their sales regardless of the economy's ups and downs. And Johnson's research shows that this sector was the second-best performer in both indeterminate- and restrictive-rate climates, trailing only energy.

These days, however, consumer-staples investors need to be discerning. Chris Sunderland, equity institutional portfolio manager at Eaton Vance, notes that because rates have been low for so long, investors have flocked to these stocks for their dividends, driving up their prices. And if inflation rises, he says, these companies will face higher expenses and "their price-to-earnings multiples will contract."

Companies in the sweet spot today have both the growth potential to justify their current stock prices and the power to pass on cost increases to customers. And stores that sell consumer staples look better on these fronts than the companies that make them. Rubin of RiverPark says dollar-store chains are particularly good at passing along costs—for example, by cutting the overall size of a product rather than

changing its price. Rubin favors **Dollar Tree**, whose core business has operating margins “in the mid-teens” in the U.S. and is growing faster than competitors. Margins aren’t as high at Family Dollar, the rival chain that Dollar Tree acquired in January 2015, but Rubin thinks that profits will grow as the chains’ integration progresses.

Joseph Agnese, analyst at S&P Capital IQ, likes **Kroger**. The supermarket giant has bulked up through acquisitions, most recently making a deal to buy Midwestern grocery conglomerate Roundy’s, and its scale has helped it boost market share and keep up in price wars with Walmart and other big-box competitors. At the same time, Agnese says, Kroger has “gained consumer loyalty with service offerings like a fishmonger and a bakery” and expanded its organic offerings—touches that give it leeway to charge higher prices. Agnese says the stock could be worth \$47 a share, or 25% higher than its current price.

## Value stocks and funds

HISTORICALLY WHEN INTEREST rates have fallen, “the tide has lifted all boats,” says Sunderland. “No longer will this be the case when we see rates going up.” In



CHRIS SUNDERLAND  
EATON VANCE

“The tide has lifted all boats. No longer will this be the case when we see rates going up.”

those circumstances stocks with lower prices relative to their earnings—value stocks, as pros label them—tend to outperform. Patrick O’Shaughnessy, principal and portfolio manager at O’Shaughnessy Asset Management, says that the 10% of stocks that are the cheapest by his measures have outperformed the broader market in all but three of the past 17 periods in which the yield on the 10-year Treasury rose by more than 1%. Johnson’s research backs this up: During indeterminate periods, large-cap value and small-cap value stocks steadily beat their growth-stock counterparts. When rates rise, that advantage goes away among large-cap stocks but remains in effect for small-cap and midcap stocks.

The easiest way to play a tilt toward value is to invest in mutual funds. Among actively managed funds, Todd Rosenbluth, director of ETF and mutual fund research at S&P Capital IQ, recommends **Dodge & Cox Stock** for large-cap stocks and **Vanguard Explorer Value** for small-caps. Each has relatively low expense ratios, and each has bested peers by about two percentage points annually over the past five years.

Exchange-traded funds offer a cheaper way to pursue the trend, with investments that track benchmark value indexes. The **Vanguard Value ETF** has an expense ratio of 0.09% and has risen 6.5% annually since its inception in 2004; the **iShares Russell 2000 Value ETF**, which focuses on small-cap stocks, has expenses of 0.25% and has returned 8.6% annually since 2000.

## And surprise! Even some bonds

RISING RATES give bond investors migraines, and for good reason: As rates rise, the value of existing bonds drops, since the interest they pay no longer looks as competitive. But if

rates rise only gradually, the decline in bond prices might not be as painful, says Fidelity’s Hofschire, and if rates rise slowly and stocks struggle, “bonds could be a safe haven.”

Gemma Wright-Casparius, senior portfolio manager with Vanguard’s fixed-income group, says investors should favor shorter-duration bonds when rates rise—because they can reinvest their money in higher-yielding instruments as their older bonds expire. Short-term-bond prices are also less volatile than those of longer-term bonds in rising-rate climates. Johnson’s research team found that three-month Treasury bills returned 6% annually during such periods, with only about two percentage points of price volatility. (Longer-term Treasuries and investment-grade corporate bonds had comparable returns, but much greater price fluctuation; that may not be a cause for concern for those who don’t need to tap their portfolio anytime soon.)

Among funds focusing on short-term bonds, Rosenbluth of S&P Capital IQ likes **DoubleLine Low Duration**, which outperformed funds in its category by 0.6 percentage points a year over the past three years, and the **Vanguard Short Term Bond ETF**, which has an expense ratio of just 0.10%. **■**

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# MEXICO



## The Powerhouse of Latin America

Major structural reforms are helping to power new fiscal growth, FDI inflows and socioeconomic development.

**M**oving forward with confidence and increased openness, Mexico is enjoying an economic boom, thanks to a series of wide-reaching reforms in key sectors. The slow growth and income inequality of the last decade have been cast aside as the country's government and business community embrace modernization with a sense of pride. Education, energy, finance, telecommunications and infrastructure are the main areas affected.

The energy sector reform introduced by President Enrique Peña Nieto in 2013 has been underpinned by a raft of legislative, labor and tax reforms designed to boost Mexico's competitiveness and make the country more attractive for business.

As the FDI flows in, there are a clutch of firms ready and waiting to help investors navigate the Mexican market. Take consulting and accounting firm Baker Tilly México, for example. With 24 offices and 600 professionals working in a variety of disciplines, the company is dedicated to business development. As an independent member of Baker Tilly International—one of the top-10 consultancy firms in the world—the highly professional Mexico team delivers the solutions new investors need to achieve their long- and short-term ambitions.

Partner and CEO Eduardo Ojeda explains: "At Baker Tilly México we have a special department where we guide investors in what they have to do in order to begin operations here. We help them to get in motion and maintain operations for a couple of years until they know the market and we help them to accomplish their fiscal and employee duties. Afterwards, they hire an individual that man-

ages the operations and we stay with them as legal and fiscal advisers: we can audit their financial statements and provide a report to their parent company or Mexican counsel. That's what distinguishes our company: we have the knowledge businesses need to start here.

"We strive to give our clients specialized care, so they recommend us based on their experience. Our policy is to provide an international service. We offer fiscal consultation all around the world and pride ourselves on having unconditional trust in our partners and associates, who undergo constant training to be even better so we can keep creating mergers."

Another company ready to help new businesses hit the ground running is Russell Bedford México. As members of Russell Bedford International, a consultancy firm representing many sectors including the automotive, mining, and energy industries, they oversee the Latin American market for the 70% of clients that are foreign investors.

"Right now there are strong investments within the automotive and aerospace industries," managing partner Jorge Jiménez Lizardi explains. "We have seen sustainable growth at 15% per year for

### Building Mexico's next mid-tier silver producer



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ourselves, and our goal is to keep growing. All investors must do a study about the country they are looking to invest in beforehand, and also look for the right advisers to give them solid assistance. Because we surround ourselves with the best people and cultivate their talents, we always make the right decision.”

Mexico boasts great opportunities in mining. Despite being rich in bitumen, gold, silver, zinc and lead, among other precious resources, Mexico remains barely tapped. Only 20% of the country has been explored in detail.

Santacruz Silver Mining, a Canadian-owned, Mexican-focused silver mining company is looking to extract as much value as possible over the coming years. With producing mines Rosario, in San Luis Potosí, which has revenues of \$2.59 million—and Veta Grande, 180 kilometers apart, as well as two advanced-stage projects at San Felipe and Gavilanes, the company aims to become a mid-tier silver producer in 2016.

Backed by a management team of technical professionals with proven track records in developing, operating and discovering silver mines in Mexico, Arturo Préstamo, CEO, says: “We believe in doing our job to the highest national and international standards, protecting the environment and the communities that surround the mining project. We take care of the communities so we can grow together, giving them the tools needed for their success. It’s teamwork.”

Santacruz Silver Mining brings with it the vast experience of Préstamo, whose goal is to have up to four or five small investments that can share synergy and production costs. “Small deposits are very important and present great opportunities,” he says.

## The Mexican Context

For almost 80 years, the Mexican oil industry had been controlled by Pemex, but with declining production and falling prices, the government is relying on private capital in order to raise the country to sustained growth.

Mexico’s first oil well was drilled in 1869, and, commercial production started in 1901. U.S. and British companies dominated early production, and in 1938 President General Lázaro Cárdenas,



President Enrique Peña Nieto and President Barack Obama, Christmas 2014

in support of labor unions, declared that all mineral and oil reserves would belong to the nation. Today, with national energy reform, the auctions therefore represent a U-turn. It is the first time private oil companies have been allowed to operate in Mexico in the modern era, and the first time ever that Mexican oil contracts have been auctioned.

Luis Vielma Lobo is a hands-on CEO in oil and gas consultancy CBM Ingeniería, Exploración y Producción. Having held top positions in Petroleos de Venezuela (PDVSA) prior to founding CBM, Vielma understands the production process very well.

“We use best international practices as our base and have developed our own methodologies which represent our differentiated products in the conception, development and execution of our clients’ projects,” he says. “Our team is made up of professionals from all areas of the petroleum value chain. Because of this, we can easily identify the opportunities that will improve a company and propose the best solution. The energy reform will be successful—in the U.S. alone there are 60 major companies interested in investing in Mexico, and we are excited to be in a position to support them.”

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**Luis Vielma Lobo**  
CEO, CBM Ingeniería,  
Exploración y Producción

CBM has created an integrated center for the development of talent (CIDT) to ensure it stays ahead of the game in oil and gas consulting and innovative solutions.

The challenge of transporting staff and resources between energy facilities quickly and safely has, meanwhile, been met by Transportes Aéreos Pegaso (TAPSA). With a fleet of helicopters to suit any

## “We identify the opportunities that will improve a company and propose the best solution.”

Luis Vielma Lobo, CEO of CBM Ingeniería, Exploración y Producción

need, unrivaled quality and an enviable safety record, TAPSA knows efficiency is the best way to retain existing clients and build a solid base for expansion.

Working from 12 bases around Mexico, the company has been providing helicopter operations off-shore and air charter transportation for business, pleasure and surveillance for more than 30 years.

“Right now, we have 33 helicopters—we are the largest in terms of helicopter numbers—and we offer all types, meaning costs vary but we control them for our clients,” CEO Enrique Zepeda Navarro,

explains. “Our main energy customers are Pemex and CFE. Some 30%-40% of our revenue is from them, 30% comes from companies related to Pemex, and the rest comes from the executive sector. It is a complicated and technical job but we have the capacity. Helicopters are more expensive to run and maintain than private jets, so the market is smaller. Growth is currently around 5% per year.”

### The Next Generation

Under the government's auction scheme, Consorcio Manufacturero Mexicano (also known as CMM), a local producer of capital goods that is also engaged in the oil and gas business, aims to take advantage of the upcoming third tender on Dec. 15th in order to implement its ultimate strategic goals in the development of oil and gas production and reserves.

The company's CEO, Rogelio Rodríguez, aware of a potentially volatile economy, moved toward the new Mexican industrial era by building valuable businesses locally. Rodríguez was born in Queretaro, Mexico on Aug. 27, 1974. He grew up splitting his time between school, soccer and learning about industrial infrastructure, which was the family business. He graduated from the Monterrey Institute of Technology and Higher Education (ITESM) in 1996 with a degree in mechanical engineering and later enrolled in an MBA program there, receiving honorable mentions from both.

For Rodríguez, CMM has been as much a way of life as a job and career. The excitement of doing something on his own is what first drove him to start a business, so, after graduate school, Rodríguez set up his first company, providing construction services



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to private and public companies. He established a commercial group in 2003, and over the next five years, CMM developed into an established business, clearing most of the external threats and maintaining its profitability. These achievements represented a watershed for CMM; it now had the management talent and expertise to undertake complex projects, and was able to undergo a major expansion in company operations, from industrial infrastructure to the oil and gas industry.

Amid last decade's economic slowdown, Rodríguez ably piloted CMM to safe harbor, using the basic principles of quality, integrity and a good work ethic. With a culture of enthusiasm, deep knowledge and technical leadership, CMM's people think of businesses in a different context, where priorities and a sense of urgency are essential. Today, CMM is a company in motion, well-prepared and confident that its best days lie ahead.

### Building the Future, Flying High

Local firm Unmanned Systems Technology International (USTI) has invested \$5 million in recent years and launched an all-Mexican drone (UAV-MX1) that can be used for surveillance and security purposes or for information gathering in a wealth of sectors. The Nuevo-Leon based firm has experienced spectacular growth recently

USTI is certified by the U.S. State Department to purchase, import and use some aerospace restricted components, and it is member of Monterrey Aerocluster, one of the three most important aeronautical clusters in Mexico. USTI meets standards based on the AS9100 system—a global aviation industry standard—which



Mauricio Ramos Pons, President and CEO of Unmanned Systems Technology International (USTI)

is a requirement for doing business with major aerospace industry manufacturers and suppliers worldwide. Under the vision and leadership of Mauricio Ramos Pons as president, USTI has been able to combine cutting-edge technologies and high-qualified professional staff. "Our commitment to customers is complete; we generate global solutions that add value to their operations," he says. "We need to be the pilots of change, so constant innovation is a fundamental tool to our development. We are creating great solutions that facilitate life and business processes by automating tasks."



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# Soar High with the Legal Eagles

Local firms are using the national momentum to help businesses take advantage of the Mexican moment.

**A**long with the wide-ranging structural reforms that have been implemented throughout the economy, new legislation and regulations must be navigated by both local and international companies, and access to expert local advice is highly valued and recommended for all investors. With this in mind, a host of Mexican firms are at the disposal of investors looking to do business in Mexico as effortlessly as possible.

For Juan José López de Silanes and Eduardo Kleinberg, managing partners of market leaders Basham, Ringe y Correa, the key to the company's success lies not only in the experience that comes with its 100-year history, but also in the constant addition of young and motivated lawyers with international experience.

"We want to exploit the market by facing down our competitors, and to keep being the leaders in Mexico, always attracting international clients," the partners say. "Another challenge is to keep generating new ideas, to always be on top of our game. We welcome young lawyers and we cultivate their talent, so we have the best of both worlds: experience and tradition that operate in a modern way.

"We are the only law firm in Mexico that's truly "full-practice"—we work in all legal service areas. For us it is important that clients can find the services they need under one roof; it is economical and more efficient that way."

Basham, Ringe y Correa are experts in corporate law and intellectual property rights and have an ever-expanding financial services area, showing why they are in high demand with international clients. As they explain:

"A client looking to invest in a careful manner can lean on us, because we know how the legal system works, both here and in their country, and can understand exactly what they are looking for.



**Juan José López de Silanes**  
Managing Partner  
Basham, Ringe y Correa



**Eduardo Kleinberg**  
Managing Partner  
Basham, Ringe y Correa



**Ignacio Domínguez Torrado**  
Partner, Ulthoff, Gómez Vega & Ulthoff

Due to the energy sector boom in Mexico, a lot of law firms want to participate, but they are not prepared. At Basham, Ringe y Correa, we have a partner specialized in that area who knows the private sector and we have formed a team that has experience in administrative, environmental, corporate and compliance—all of them related to the energy sector."

## At the Forefront of Change

In the meantime, Alberto Saavedra, managing partner of the Santamarina y Steta law firm can see the huge benefit of the ongoing government reforms for the competitiveness of the country, which he feels already offers more than any other nation, especially regarding human capital.

"Many new industries can now operate at even more competitive costs in Mexico in a safe and easy-to-understand legal environment; the reforms are the platform from which Mexico will be able to further industrialize," he explains. "Mexico has a great platform in terms of its laws, with a high sense of ethics, values, integrity, commitment and efficiency. As a company, we think proactively so we find balance. Everyone can find a win-win situation; that's our added value."

Founded in 1947, Santamarina y Steta offers legal solidity in the business environment based on extensive knowledge and experience in a huge scope of local and international affairs. The firm has the



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Founding Partner of Alanís,  
Serrano y Doblado



**Fernando Doblado**  
Founding Partner of Alanís,  
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**Jorge Jiménez Lizardi**  
Managing Partner,  
Russell Bedford México

highest quality services based on ethical and professional standards, excellence in provision of services in corporate law and its more than 30 areas of expertise. It boasts almost 1,000 active clients in the private sector, government organizations and non-profit organizations, with local and international investment and more than 90 lawyers.

"Right now, our firm has offices in Monterrey, Tijuana and Querétaro. Our goal is to continue to recruit talented people to our firm who are ready to help our clients with their needs," Saavedra says. "That, combined with the guarantees the investor has that their business here is protected under a legal framework, shows that Mexico is most definitely the place to be."

Uhthoff, Gómez Vega & Uhthoff is another very well respected law firm. Having been in business for more than 110 years, the firm is the market leader in terms of intellectual property matters—a specialism which represents 90% of its client base. It moved into corporate law in 2002.

As Ignacio Domínguez Torrado, partner at Uhthoff, Gómez Vega & Uhthoff, explains: "There are more than 3,000 brands in this country, so we are extremely busy with patenting. There is a big but justifiable difference, since the pharmaceutical field heavily depends on generics as well.

"We are proud to say that we were among the first law firms involved in combating piracy in Mexico and around the world. Among the areas in which the firm has expanded are biotechnology

and pharmaceuticals and we have also focused on technology as our clients look for better protection for their investments in Mexico. We have branched into regulatory and immigration law as well, and for the past two years have been reinforcing our sports law area to protect the rights of amateur athletes."

Working closely with domestic and international clients in a multitude of sectors, law firm Alanís, Serrano y Doblado (AS&D) is proud to have handled some of the biggest contracts in the business since it started up in 1989. With bases in Mexico City, Cancun, Playa del Carmen, Los Cabos and León, AS&D boasts substantial involvement in proceedings before federal agencies and financial institutions.

## "Our goal is to keep recruiting talented people who are ready to help clients with their needs."

Alberto Saavedra, Managing Partner of Santamarina y Steta

"I participate in the Nestlé Company, both holding assets and foreseeing investments issues and coordinate foreign affairs as an external in Switzerland," says founding partner Francisco Serrano. "Our firm's participation and constant commitment to the companies that we work with has opened doors that other law firms can't open; we are now the leading law firm in Mexico's southeast. We really enjoy getting deeply involved in a business to the point that we perfectly understand it so we can open all the doors it needs."

The company has been working with Fox Television Group since it entered the Mexican market, ensuring it is properly represented and advised with regards to changes in the regulatory environment. "The Mexican workforce is of a very high quality, and Mexican authorities are very supportive of investors; as a country, we have great opportunities for growth," Serrano says. "Mexico has ample

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Armed with an astute knowledge of the competitive challenges within the financial, telecommunications and public sectors, Grupo CSI stands out as a provider of technological solutions that optimize the operations processes that connect its clients with the end users.

Over the last 25 years, Grupo CSI and its subsidiary companies have played major roles in the development of remarkable strategies that have considerably improved operating procedures for companies within a wealth of sectors.

Procedures include reducing the time it takes to reply with regards to the authorization of bank credit, and increasing the amount of information that can be stored with regards to the automatization of government paperwork through the creation of digital archives and the development of mobile apps.

One of Grupo CSI's greatest success stories lies in the expertise of its Business Process Outsourcing division being implemented in one of the five most important banks in the world, in one of the most competitive markets in the world.

The customer, working in an environment that requires speed, flexibility, and high security standards, was seeking to optimize its approval system for credit-card requests at its kiosks. The challenge consisted of designing a system capable of working with each product so that it would take the bank only 15 minutes to reply. The new system was implemented and immediately replaced the conventional process where decisions take between three and 15 days, demonstrating that the Grupo CSI solution is now the fastest in the market.

The big benefit for the bank lay in a 30% increase in sales, reduced operating costs, and increased customer satisfaction.



Margarita Rodríguez Loza  
CEO, Grupo CSI

### International Contracts

Cloud storage systems and control of digital documents are just some of the other technological solutions that this Mexican company offers its clients, with the high quality standards supported by exacting international institutions, such as ISO, CMMI and Moprossoft as well as an infrastructure of more than a thousand work-stations that offer a service 24 hours a day, seven days a week. Grupo CSI has central offices in Mexico City and a center of research and development in Silicon Valley, California.

Grupo CSI companies do not only attract contracts from the world's most important financial institutions, however. Various government organizations, such as SAT, IMSS and PEMEX, have contracts in place for the availability and security of services of the Group, as well as international companies working in the infrastructure, telecommunications, logistics and retail sectors.

The drive behind this world-class Mexican company reflects the leadership of Margarita Rodríguez Loza, CEO of Grupo CSI, who dedicates her working life to converting the subsidiaries into leaders of outsourcing for diverse multinational companies looking to expand in Mexico and Latin America. With this vision, the Mexican company offers excellent quality and operating systems that are adapted to the requirements of the companies looking to improve interactions with their clients.

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The Quintanilla Family: At the helm of Transportes Unidos Mexicanos (TUM)

opportunities for investors and we receive them with open arms. I invite investors to come and see how the country has grown."

### Logistical Excellence

In the meantime, Transportes Unidos Mexicanos (TUM) are also excited at the new opportunities for the logistics industry. As a key player in the sector, it stands to benefit hugely from the increased presence of international markets and companies, and the much-needed energy sector reform. Miguel Quintanilla Rebollar, president of TUM, explains that the company, established in the 1930s, has always been a family-run affair that aims to provide the best service for all their clients.

"TUM has 1,500 trucks and over 500 mid-range trucks; we do courier delivery service through Aeroflash, a company that we acquired. Before that we made a partnership with FedEx," he says. "This year we begin working with our first airplane, working with a Mexican company to acquire aircraft."

"Mexico has changed. It used to be more focused on importing and domestic consumption was quite closed. Now we can see a new market for domestic transportation and the automotive industry is growing, which requires companies specialized in logistics. This leads us to be part of the production chain as we go straight to the assembly plant."

"We are overseeing industry storage as well. Our company covers all Mexican national territory as well as the U.S. and South America. We're looking to expand both through land and air, without doing cabotage: helped by our partners, we can look to implement something that benefits everyone. Serving as a complement is our storage service, in which we've been showing steady growth in Mexico City, Monterrey, and Guadalajara. Our partnerships with FedEx and Aeroflash are also helping us grow and open up industries."

"Our goal is to be the best in our business, looking after our clients and employees, and creating even more partnerships so we can retain our leadership in the logistics field," Quintanilla Rebollar concludes.

The Mexican moment is once again close. However, this time all the tools needed for private business to achieve growth are also there. The importance of the energy reform cannot be overstated, as the flow of FDI it will bring into the country will see GDP growth boosted for at least the next decade. ●



INVESTOR'S GUIDE 2016

ROBO-ADVICE

# The Battle for Millennials' Money

Why a generation of young investors is flocking to Silicon Valley rather than Wall Street, and why hope is not lost for your grandfather's brokerage.

*By* JONATHAN CHEW



A

**T 32, BO LU IS A MILLENNIAL CAUTIONARY TALE** for old-school banks and brokers. A first-generation American who emigrated from China with his parents at 7, Lu lives in a world of monitors and motherboards. He graduated with a computer-science degree from the University of

Illinois and landed at Microsoft. He and his engineering friends in Seattle soon went looking for an adviser who could guide them about investing their nascent savings.

To their surprise, they found none: Despite their earning potential, no one was willing to take them on as clients. At the time, Lu recalls, “none of us really had any money, but we thought we had the opportunity to accumulate some.”

So Lu coded his own solution. In 2010 he co-founded FutureAdvisor, an online investment platform that uses algorithms to direct users’ savings to diversified exchange-traded funds. Depending on your risk appetite, the software automatically rebalances your account, navigating you through the world of equities. “This company was partially created to help people like my group of friends,” Lu says.

Within five years, FutureAdvisor had \$700 million of assets under management, and about a quarter of those using the free service were under 35. At least one financial giant paid attention. In August, BlackRock—the world’s largest asset manager, with \$4.5 trillion under management—bought FutureAdvisor, seeking in one fell swoop to make itself more relevant to the smartphone generation. “We didn’t think we had enough retail and millennial DNA, [but] if we could find the right firm to bring into BlackRock, we could accelerate our plans,” says Robert Fairbairn, senior managing director at BlackRock.

The acquisition was a watershed in the battle for the dollars and loyalties of millennials, the Americans born between 1980 and 1997. It’s a generation that transitioned from college into adulthood facing slimmer job opportunities and heavy indebtedness, and its collective wealth is still tiny. For example, only 5% of the \$15.9 trillion in U.S. households’ mutual fund assets are held by millennials, according to ICI, the fund industry’s trade group. Not coincidentally, they’re an afterthought for many financial pros. Just 30% of advisers say they’re actively seeking clients under age 40, according to research firm Corporate Insight. For an industry that has thrived by managing



Bo Lu, the 32-year-old founder of FutureAdvisor, built the site after a financial adviser declined to take him as a client.

the net worth of peak earners and affluent retirees, grappling with the bank accounts of ladder-climbing young investors holds little appeal.

But industry leaders know that they can’t afford to shut doors on millennials. They’re already the most populous generation in the U.S., and their potential for wealth creation is huge as they approach their peak earning years; by 2020 millennials could have \$7 trillion in liquid assets. “You’ve got this extraordinary demographic shift [away] from baby boomers,” says Fairbairn. “That’s going to lead to an aggressive market-share game.”

It’s a game being played mostly with technology, especially the apps and

websites lumped together as “robo-advisers.” Startups such as Wealthfront, Betterment, and Lu’s FutureAdvisor aim to speak the language of younger investors (beginning with their Silicon Valley brand names). They share key characteristics: low fees, no or low account minimums, and snapshots of your portfolio in the palm of your smartphone-holding hand.

Established wealth managers, however, are not passive spectators. “If we don’t stay at the top of our game, our industry is ripe for disruption,” says Nicole Sherrod, managing director of the trader group at TD Ameritrade and leader of TD Ameritrade U, a platform that introduces college stu-

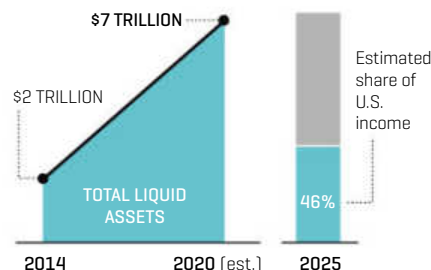


dents to simulated investing. Legacy brokerages like hers are launching robo-tools of their own, while betting that millennials will eventually need—and pay for—something more. Sherrod cites Aug. 24, 2015, when the Dow dropped 1,000 points in intraday trading as part of the biggest stock market correction since 2008. That day, index-fund giant Vanguard—which offers both an automated platform and live advisers—had a 9% increase in calls for consultation. “People still want to throw out a lifeline and talk to a professional,” Sherrod says.

Will high tech trump high touch? To find out, *Fortune* talked to older and newer brokerages and to young investors themselves for their takes on the ever-shifting fight for the millennial wallet.

## Growing Influence

Millennials are about to hit their peak earning years, making them a desirable target.



## The Millennial Customers

**JONATHAN CANALIZO** learned about money by playing online games. Titles like *Diablo 2*, *Ragnarok*, and *World of Warcraft* introduced him to the art of bartering and the effects of inflation. While he was a finance student at Stetson University, his interest in investing sharpened as he took part in a program that let students manage a real portfolio of bonds and stocks.

Managing his own money, however, proved disillusioning. Shortly after graduating, Canalizo opened an account with discount broker Scottrade. “I hated the fees and felt the service was mediocre,” says Canalizo. The site swamped him in much more data than he needed, and he gave up on the mobile app. (Scottrade senior vice president Joe Correnti says the company’s apps and research are part of “a

## How the Robo-Advisers Stack Up

Mobile and online investing platforms are key to the effort to attract millennial customers.

	ASSETS UNDER MANAGEMENT	NUMBER OF CLIENTS
Schwab Intelligent Portfolios*	\$4.1 BILLION	55,000
Betterment	\$3.0	120,000
Wealthfront	\$3.0	50,000
FutureAdvisor	\$700 MILLION	5,300

\*A division of Charles Schwab.

very strong offering to clients.”) When a friend introduced him to Robinhood, a no-fee trading app, he happily switched. This year Canalizo, who’s now an accountant in Florida, used \$5,000 in capital gains from his ETF-grounded Robinhood account to buy a condominium. “Once you know a couple of [investment] things, you can handle the rest on your own.”

Studies show that millennials, forged in the fire of the Great Recession, share key characteristics in their relationship with money. They’re risk-averse. They distrust institutions. They want transparency about fees. A Fidelity study showed that one in four millennials “trusts no one” on money matters. “When millennials see baby boomers doing their finances, they worry ... In their eyes, boomers are the ones who created the problems to begin with,” says Stefanie O’Connell, the 29-year-old author of the book *The Broke and Beautiful Life*.

The hard task is persuading millennials to invest in the markets in the first place. In a Bankrate survey, millennials said that cash is their preferred long-term investment—even though returns on cash have almost always trailed those of stocks and bonds in the long term. Patrick O’Shaughnessy, a 30-year-old portfolio manager at O’Shaughnessy Asset Management (a company run by his boomer father), wrote *Millennial Money*, a book that implores his peers to tilt toward long-run equity investing. “Millennials seem much more conservative,” he says. With such long investment careers ahead of them, “they don’t need to be so cautious.”

The new breed of AI-driven managers—most of which are either online platforms like Wealthfront and Betterment or mobile apps like Robinhood and Acorns—offer millennials a way to trade stocks without having to deal with a potentially untrustworthy human intermediary (boomer or otherwise). Their “advice” takes the form of algorithms that suggest allocations



ADAM NASH  
CEO, WEALTHFRONT



The robo-adviser leader says brokerages that build relationships with millennials today could earn their long-term loyalty: “The kids don’t give up rock ‘n’ roll.”

based on the user’s responses to survey questions; they also offer on-the-go trading. The platforms are unemotional, subservient, and agenda-less—the polar opposite of many traditional advisers, especially those with commission-based models. The investing startups sell access to a diversified list of inexpensive investments, such as index funds and ETFs, and assure millennials that they can grow their wealth while mitigating risk.

The startups make the assumption that humans are not smarter than a beta-grade line of code. But they also charge next to nothing and require only a little skin in the game. Wealthfront, for example, charges no management fee for any account under \$10,000, and 0.25% after that. Betterment allows you to open an account with no cash. That’s a big contrast to, say, Charles Schwab, where most accounts require a minimum deposit of \$1,000 and every trade costs \$8.95. If you want to work with a financial adviser, you’ll face annual fees of another 0.5% to 1.5% of assets under management.

The contrast explains why advocates of robo-advisers say they’re slowly removing the barrier of entry into stocks and bonds. “This is the democratization of investing. And we are just at the beginning stages,” says Lu.

## The New Robo-Breed

**VLAD TENEV BOUGHT** his first stock at the age of 12, after his parents helped him set up an account on E\*Trade. His interest in the markets continued through his years at Stanford, where he earned a degree in mathematics and physics, and as a Ph.D. student at UCLA. But the online-trading experience was increasingly “just not up to par with the stuff we use every day,” he says. “Look at Instagram, Uber—products that set the bar for user experiences.”

In 2013, Tenev and his former Stanford roommate, Baiju Bhatt, created Robinhood, designing it specifically for mo-

bile devices. Customers can download the app and register a new account in about five minutes, and easy-to-read buttons and menus make trading relatively frictionless. Since then, in two years, customers have made trades worth more than \$2 billion via their app. The average age of a Robinhood customer is 28, and a quarter of them come in as first-time traders, says Tenev (who is himself 28).

For millennials, accustomed to apps and websites that work easily and intuitively, an investing platform’s design can be a deal breaker. That’s creating opportunities for young, programming-savvy entrepreneurs who are as passionate about typefaces and algorithms as they are about managing assets. Jon Stein, the 36-year-old CEO of robo-advising brokerage Betterment, spent the first five years of his career as a consultant to bankers and brokers, coming away with a self-described “disdain” for a Wall Street model that, he felt, “was making money and acquiring customers but not paying attention to them.” Poorly designed trading platforms, he says, were part of that neglect.

Now Stein sees a field ripe for growth. Betterment manages \$3 billion for 120,000 clients, two-thirds of whom are millennials. “We have lower costs, we

give better advice, we have a better user experience,” says Stein. “Why would you go to Walmart to buy something if you can buy it cheaper and faster with Amazon’s instant delivery?”

Even for millennials who want a relationship with an adviser, technology has cracked open age-old customs. “The older financial planners are the ones sitting beside a mahogany desk and saying, ‘Come to my office downtown,’” says Sophia Bera, the 31-year-old founder of Gen Y Planning, a virtual advisory firm whose clients can build portfolios via email or Skype. (Bera is based in Minneapolis but has clients as far-flung as London and Nagoya, Japan.) “I have Google Hangouts meetings with my clients and have a great connection with all of them. It’s not weird at all.”

Startups see themselves as better able to tweak their products to the fast-changing whims of the younger set. They also think relationships forged with millennials today could evolve into something permanent. Adam Nash, CEO of Wealthfront, which has \$3 billion under management, says his customer base is 60% millennials, and adds that Wealthfront is courting the next generation of investors in part for their long-term loyalty: “The kids don’t give up rock ‘n’ roll.”

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**Money** "BEST ONLINE BANK" 2011, 2012, 2013, 2014, 2015.

**Kiplinger's** "BEST ONLINE BANK" 2014, 2015.

**GOBankingRates** "ONLINE BANK OF THE YEAR" 2015.

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**SEAN BELKA**  
DIRECTOR, FIDELITY LABS

“[Millennials] grew up with mobile. They grew up with the web. How can we continue to meet them where they are?”

## The Old Guard Adapts

**NAUREEN HASSAN**, the executive vice president of investor services at Charles Schwab, is the firm's tech advocate. In her previous role at Schwab's adviser services unit, she was able to see firsthand the digital impact on a previously relationship-first industry. About half of Schwab's roughly \$2.5 trillion in client assets are connected to some form of ongoing adviser-client relationship—and advisers were consistently telling the company that changes in technology posed greater challenges to their practices than changes in client demographics.

So in March, Charles Schwab launched Schwab Intelligent Portfolios, an automated-advice offering that uses algorithms to rebalance investment portfolios, with a focus on diversified ETFs, and dispenses with advisory and account service fees. Is Schwab copying startup competitors or reinventing itself? “We don't think it's an either/or game,” says Hassan. “This crosses the age spectrum. To say boomers go to Schwab and millennials go to startups is too simplistic.”

What established brokerages have in spades are resources—and with them, the ability to scale new products to the huge group of existing investors under their umbrella. Schwab Intelligent Portfolios amassed \$4.1 billion in assets under management within six months of launching—making it, on paper, bigger than any new-school robo-adviser. Of the new-to-firm clients to the platform, Schwab says, 46% are under 40. Vanguard's own hybrid automated tool, Vanguard Personal Advisor Services, came out of beta testing in May with around \$17 billion under management, of which \$7 billion were new-to-firm assets gained during its pilot phase.

As more brokerages launch robo-advisers, the battle to differentiate will get more heated. Some veterans think the real test will come the next time there's a true bear market—when investors will want reassurance as much as they want a killer app. The last market crash ended in early 2009, and

“a lot of these newer and smaller firms haven't gone through the harder times,” Hassan says. Wealthfront and Betterment didn't gain critical mass in clients and assets until relatively recently, but their founders say their clients can handle a little volatility. Betterment's Stein points to its Twitter account and resource center as a channel to address concerns during a downturn. “Our advice is simple and straightforward,” he says. “Stay calm and stay the course.”

In an effort to set themselves apart, established brokerages are embarking on the kind of projects more suited to Google than Goldman Sachs. In November 2014, Fidelity showcased StockCity, a 3D virtual-reality interface that uses a VR headset to transform an investor's portfolio into a city, each building representing a stock's information. It was the brainchild of Fidelity Labs, a division set up in 1998 to explore emerging technologies. Among the Labs' other inventions: Stocks Nearby—which lets users of the Fidelity app explore publicly traded

companies near their present location—and an app for the Pebble smartwatch. There's even been synergy between old and new: Betterment worked with Fidelity to launch an automated platform for advisers, and Fidelity is testing its own robo-adviser. Millennials “grew up with mobile. They grew up with the web,” says Sean Belka, director of Fidelity Labs. “How can we continue to meet them where they are?”

One thing seems clear: Millennials have no qualms about abandoning firms that don't meet them on their terms. In a survey by LinkedIn and market research firm Ipsos, nearly seven out of 10 millennials said they were open to trying financial products and services from nonfinancial brands (think Apple or Google); only 47% of Gen Xers said the same. These experimenters could get used to a world where lines of code are as helpful as a mahogany-desk adviser.

It's a future Wall Street wants to avoid. “The old model [made it] too hard for millennials to get invested,” says Hassan. “What we are changing is to leverage technology to make it easier and to keep up to date.” The bet is that when millennials look up from their phones and want a human touch, old-school brokerages will be there with reservoirs of experience—and, the old guard hopes, without the intergenerational baggage.




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The background of the page is a complex geometric pattern. It features numerous 3D cubes and rectangular prisms in various shades of dark green and grey, scattered across the right side and top. On the left side, there are large, overlapping rectangular blocks with diagonal hatching patterns. The overall design is modern and architectural.

New technologies are remaking companies in every industry. The best way to buy into this new class? Invest in the tech that powers it.

By KIA KOKALITCHEVA

# HOW TO INVEST IN THE 21ST-CENTURY CORPORATION

*Illustration by*  
YASLY

**LET'S FACE IT—TODAY'S TOP COMPANIES** are radically different from the ones we grew up with. The corporate campus has given way to the private home or co-working space. The independent contractor now vies with the full-time employee. And for some, physical products have become digital downloads. The firms built for this new reality—what *Fortune* calls 21st-century corporations—are rapidly adopting technologies that allow them access to new business models and newer ways of working. Investors should rightly see the companies developing these technologies as attractive investment vehicles, but not all stocks are created equal. We dug into 12 prominent companies working in four promising categories—the Internet of things, data analytics, cloud computing, and artificial intelligence—to see where investors should place their bets. Six are slam dunks. The rest? Well, read on. Here's how they stack up.



## Internet of Things

What kind of “things” make up the so-called Internet of things? Consumer gadgets like intelligent thermostats, smartwatches, and connected cooking scales, sure—but also factory equipment, vehicles, and grid infrastructure that can predict problems and optimize operations.

Founded in 1892, **General Electric** believes that the “industrial Internet” will serve as the connective tissue between its century-old strengths and a new era. Can an old dog with a \$307 billion market cap learn a new trick? GE predicts its revenue from these technologies will total \$5 billion in 2015 and \$15 billion in 2020. Nick Heymann, a research analyst who follows global industrial infrastructure companies at William Blair, estimates that they can generate up to 25% of earnings by 2020. With such potential, GE is undervalued, Heymann says, and could easily double its share price to \$60 by 2020.

**THE FORTUNE TAKE: BUY.**

More than 95% of today's smartphones use chips based on designs by **ARM Holdings**. Now the fast-growing British company wants to put them in the connected gadgets that make up the Internet of things. Hans Mosesmann, a managing director at Raymond James,

believes ARM's ability to raise its royalties for all kinds of chips and boost profits makes it a solid long-term investment. Revenue growth doesn't hurt either: Analysts predict 2016 revenue of \$1.7 billion, up 13% from 2015. **OUR TAKE: BUY.**

If every object in the future will be connected, telecommunications giant **AT&T** wants to be the one to provide that service. A realized Internet of things stands to generate new revenue for a company that made \$39 billion in its most recent quarter. But that's a long way off. In the meantime, growth has slowed in the fiercely competitive U.S. wireless market, prompting AT&T to diversify away from the business with its \$49 billion acquisition of DirecTV. A silver lining? AT&T pays a cushy dividend, to the tune of 5.6%, for investors who are willing to wait. **OUR TAKE: WAIT AND SEE.**

## Data Analytics

When the term first rose to prominence, no one really knew what “big data” was, let alone which companies had it. That's all changed today. Corporations have built out entire departments to glean insights, find savings, and generate revenue from that information. And data startups are everywhere—though it's too early for most to be investment vehicles.

San Francisco's **Splunk** sells software that analyzes the data generated by corporate systems. Splunk continues to reliably grow its annual revenue—\$451 million in 2015; a predicted \$650 million in 2016—as it adds customers and renews others like Comcast. It's expected to become profitable in 2016. John Rizzuto, a managing director at SunTrust Robinson Humphrey, believes that Splunk's \$60 share price is a bit high—the company's forward P/E ratio is 202.3—but justified as it becomes increasingly trusted among networking and security companies. **OUR TAKE: WAIT AND SEE.**

Seattle's **Tableau Software** sells software aimed at helping regular employees make sophisticated data analyses. It's growing rapidly: Tableau expects to end 2015 with \$620 million in revenue, and analysts expect it to generate \$870 million in 2016. “The downside to that is that it's very expensive,” says Rizzuto, noting Tableau's forward high P/E ratio of 259.3.

**OUR TAKE: WAIT AND SEE.**

Then there's **Hortonworks**. The Santa Clara, Calif., company is a major driver of development of Apache Hadoop, the open-source framework underneath many of the largest big-data projects. It is well-known within the data community and has the potential to hit profitability in two to three years, Rizzuto says. Analysts expect the company to rake in \$186 million in 2016. But there are reasons for investors to hesitate: “The company is putting a lot of money back into

its business, rather than rewarding its shareholders,” Rizzuto warns. **OUR TAKE: DON'T BUY.**

## Cloud Computing

By now nearly everyone's heard about “the cloud,” one of the buzziest tech terms of the past decade. The creation of cloud infrastructure and provision of it to other companies have given rise to a generation of Internet-based businesses that outsource the computing resources they need from day one.

**Microsoft**, one of the “big four” cloud infrastructure companies alongside Amazon, Google, and IBM, stands to greatly benefit from a cloud-computing era. Its \$5.9 billion in cloud revenue in the quarter ended Sept. 30 was up 8% from a year ago, but revenue from Azure, its cloud platform, more than doubled year over year. Though Microsoft's overall revenue continues to decline, analysts expect cloud growth to reverse that. **OUR TAKE: BUY.**

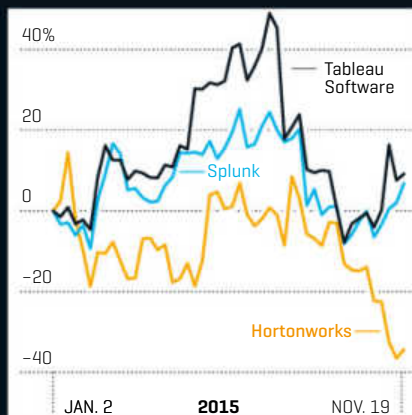
Known for supplying the chips that power most personal computers, **Intel** also sells chips for the servers in corporate data centers—the machines that make up the cloud itself. That business brought in \$4.1 billion in the three months ended Sept. 26. But the steep decline of the consumer market and stiff competition in the enterprise market continue to weigh on an otherwise stable company.

# Night and Day

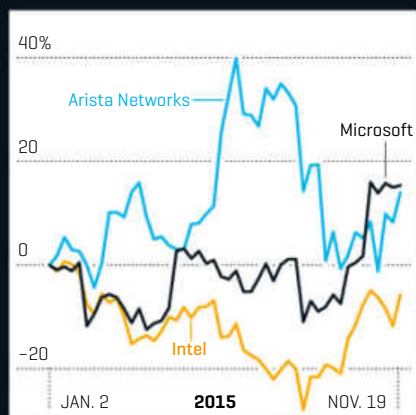
It seemed that 2015 would shape up to be a banner year for tech stocks, but a major summer stumble tempered investors' enthusiasm. Here's a look at the relative growth or decline in the stock prices of the companies we looked at.



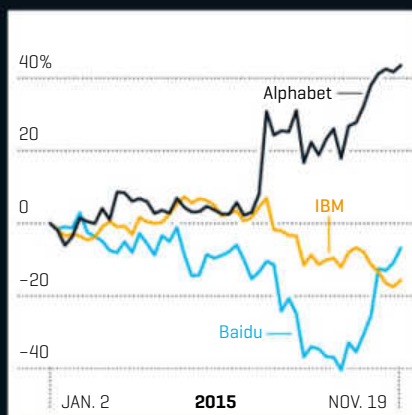
INTERNET OF THINGS



DATA ANALYTICS



CLOUD COMPUTING



ARTIFICIAL INTELLIGENCE

Intel must truly innovate, Mosesmann says, to have any chance at prosperity.

**OUR TAKE: DON'T BUY.**

**Arista Networks** is not a household name to most, but the 11-year-old company has amassed a roster of big-name customers like Netflix and Salesforce by providing networking equipment to power their cloud-based software. Its stock has had a great run; at \$73, Arista shares trade 70% above its June 2014 IPO. But Morningstar analyst Ilya

Kundozerov says Arista lacks any advantage that would preclude competitors from offering similar technologies. With a forward P/E of 28.5, it's better at a lower stock price.

**OUR TAKE: DON'T BUY.**

## Artificial Intelligence

The term "artificial intelligence" still invokes sci-fi movie nightmares for many, but the category is on fire as industry realizes the incredible levels of efficiency the technology can achieve.

Revenue continues to decline for **IBM**. (Analysts predict total revenue of \$81.8 billion in 2015 and \$80 billion for 2016.) But its effort to reinvent itself include a big bet on AI in the form of Watson—a layer of intelligence that IBM hopes to add to its various businesses. There's hope, says Scott Kessler, head of tech-sector equity research at S&P Capital IQ. "We see IBM as an attractive turnaround candidate for 2016." **OUR TAKE: BUY.**

In 2015 the company formerly known as Google—**Alphabet**—revamped its corporate structure to allow further scrutiny of the various efforts (Nest, Google X, Life Sciences) adjacent to its core advertising business. Its dedication to AI spans both its core and experimental divisions and could accelerate the ad business responsible for most of its revenue. (Alphabet is expected to make \$85.7 billion in total revenue in 2016.) "Investors can tolerate losses in moon-shot businesses because they're planting the seeds for longtime growth," says Colin Sebastian, a senior analyst at Robert W. Baird. **OUR TAKE: BUY.**

Finally there is **Baidu**, which operates China's top search engine and is often called China's Google. Though it has been listed on Nasdaq since 2005—it's trading at about \$205 today with a forward P/E ratio of 30.7, higher than Google's 22—most of its business is still in China. That makes Baidu vulnerable to its economic swings. (Baidu's share price fell 35% between July and September for that reason.) The company has invested heavily in artificial intelligence as a means of improving its search and advertising businesses. So long as it can keep new competition at bay, Kessler says, Baidu should be well-positioned to maintain its upward trajectory.

**OUR TAKE: BUY. [B]**



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*Illus*

**IT'S NO SECRET** that, these days, a single post on social media can have a dramatic impact. Consider two days in January 2013 when a series of damning—but false—tweets sent two stocks plunging. Some of the posts claimed that a company called Audience was being criminally investigated for “rumored fraud.” A second set claimed that the FDA had seized clinical-trial records of Sarepta Therapeutics on suspicions the results had been “doctored.” Only later did many readers notice that the authors were not in fact the well-known short-selling firms Muddy Waters and Citron Research, but rather two fake accounts using similar names with misspellings: @Mudd1waters and @Citreonrearsc. The stocks fell 28% and 16%, respectively.

But there's a surprising coda to this anecdote. Despite fooling the market, the perpetrator managed to net only \$97 from his deception. By the time he bought shares of each a mere 10 minutes after his tweets moved the market, it was

**Hedge funds  
are increasingly  
using services  
like Dataminr to  
gather lightning-  
quick intel on  
social media.  
Does it pay off?**

*Illustration by* **VASAVA**

*Illustration by* **VASAVA**

Opposite, top: Ted Bailey at Dataminr's offices, with a display showing his company's stream behind him. Below: Matthew Granade, who heads the data-crunching team at hedge fund Point72, the reincarnation of SAC Capital, calls this a "golden age for new investment data sources."

too late. Other investors—some, no doubt, using their own social media tools—had figured out the ruse, and the share prices almost instantly bounced back. So says the Securities and Exchange Commission, which filed suit against the alleged social media scammer, a Scottish man, in November. The SEC's case, which was accompanied by a federal criminal indictment, is the first to charge market manipulation via Twitter. (The accused has reportedly denied any wrongdoing.)

The episode reveals a lot about ways investors are using Twitter and the like to guide trading decisions. Increasingly, there's a new technological race in which hedge funds and other well-heeled investors armed with big-data analytics instantly analyze millions of Twitter messages and other nontraditional information sources to buy and sell stocks faster than smaller investors can hit "retweet."

Irish research firm Eagle Alpha, for example, digested 7,416 comments on a Reddit gaming thread in October to predict that Electronic Arts would sell more of its new Star Wars videogame than it had projected; Electronic Arts soon raised its sales forecast, citing "excitement" over the game. Monitoring web traffic on Alexa.com this spring, the quant

team at Goldman Sachs Asset Management noticed a spike in visits to HomeDepot.com and loaded up on the home-improvement stock months before the company increased its outlook and shares surged. "You have this explosion of other independent real-time sources. It's a lot easier to get to [on-the-ground] truth," says Matthew Granade, chief of the newly created data-crunching team at Point72, the reincarnation of Steven Cohen's hedge fund SAC Capital Advisors. "Overall, I think this is a golden age for new investment data sources."

That has meant a wave of demand for services such as Dataminr, which applies advanced analytics to the entire Twitter "fire hose" to detect events likely to move the market. Founded in 2009 by three former Yale roommates, the company now has roughly 75 financial clients—up from 50 a year ago—including the majority of big investment banks and at least half the top hedge funds, overseeing a collective \$1 trillion in assets. (Dataminr's customers also include *Fortune* 500 companies, media outlets, and government entities.)

"Dataminr feeds are like table stakes right now: Most hedge funds need to have it," says Santo Politi, a founder of Spark Capital, a venture capital firm that was an early backer of Twitter and has a majority stake in a two-year-old hedge fund, Tashtego, that trades on signals from social media and other nontraditional data.

Whether or not they use Dataminr, hedgies are increasingly paying attention to Twitter and its ilk. "They're just now starting to take advantage of what's available through social media and this wisdom-of-crowds concept," says Divya Narendra, founder of SumZero, a social network for pro investors. "That's a new phenomenon." But how to best take advantage of it—or even whether to do so—is a subject of sharp dispute.

**WHEN DATAMINR LAUNCHED** six years ago, a billion tweets had been posted over Twitter's history. Now that quantity is produced every two days. Dataminr founder and CEO Ted Bailey saw opportunity. His company became one of the first to buy direct access to the entire stream of tweets. Today it remains one of few companies that still have it; Twitter cut off the full feed for some companies in 2015 after acquiring Gnip, which resells social media data to analytics businesses and other clients. Access to the complete Twitter stream costs about \$30,000 a month, with fees based on usage that can take the charges up to \$1.5 million a year, according to people who have used the data.

A key reason for Dataminr's prime position: Twitter owns a stake in it, according to Tom Glocer, another investor in Data-

minr and a board member of Morgan Stanley (which is itself a client of Dataminr's). That's one of the service's "big differentiating advantages," he says. Bailey would only shrug when asked about the investment—or any of his company's finances. Twitter declined to discuss its agreements or prices, but it says a growing number of hedge funds are buying its feeds directly.

At 34, Bailey doesn't lack self-assurance, though he may lack sleep—he's got dark circles under deep-set eyes. Tall and with a grin just short of a smirk, he's sitting in Dataminr's headquarters in Manhattan's Koreatown. Bailey expects to double his staff—currently about 200 employees divided among offices in New York City, Washington, D.C., London, and Bozeman, Mont.—over the next year. "At this time we are the leader, if not the only [company] that really has built these products and been successful," he says. Bailey has lofty ambitions. He wants Dataminr to be "an industry-defining company that's around for a long time, that's a very significant, large company."

Bailey sees almost limitless uses for his technology. "It's pretty hard to come up with industries that would be happy knowing later, less, and not everything," he says. "So if you think of it that way, the opportunity for Dataminr really is as big as the need for early information, more information,

and full context on information and events around the world.”

Today, Dataminr specializes in identifying black-swan events, or “unknown unknowns,” as Bailey calls them, before the market reacts. It uses machine learning and cross-references 30 other data sets—from maps to triangulate users’ locations, to patent data, to stocks’ movement—to identify tweets and trends with impact, based on unusual patterns and “clusters” of similar tweets.

Using this method, Dataminr says it delivers early intel to its clients. Translating tweets from French and German, the service began alerting clients to the terrorist attacks in Paris five minutes after the first occurred outside the Stade de France, more than 45 minutes before the Associated Press tweeted the news. Dataminr revealed preliminary reports of Volkswagen’s emissions scandal three days before its stock price plummeted 30%. Oil and gas traders, Bailey says, received alerts about the death of the King of Saudi Arabia more than four hours before crude prices spiked on the news.

Dataminr is the biggest player in a nascent industry—call it alternative big data for big finance—that has exploded in the past six months: In March it raised \$130 million from Fidelity as well as other investors, including former



## SOCIAL MEDIA MARKET MOVERS

These days all it takes is a few words on Twitter to send a stock reeling—or climbing.

Citigroup CEO Vikram Pandit, valuing the company at \$700 million. (Since then, Fidelity, which owns 10% of Dataminr, marked down the value of its stake by more than a third. Dataminr declined to comment, but a person close to the startup contends the move reflects a change in general market conditions and not Dataminr's prospects.)

It's tricky to determine how much funding is flowing to companies like Dataminr, but the amount appears to be rising. Financial technology ("fintech") startups have received more than \$11 billion in venture capital funding so far this year, 83% more than all of last year, according to CB Insights. Banks like Citigroup and Goldman Sachs (another Dataminr investor) have backed 15 of those companies in 2015, compared with nine last year. CB Insights doesn't specify what portion of those investments were for data analytics but says it's a "hot" and growing category.

Twitter is only one of many new hoses from which investors are guzzling. Whereas hedge funds

**Citron Research**  
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At these prices **MNKL** has signif more downside than **VPRX**-- far worse offender of the reimb sys - more to follow. VPRX can't live in a vacuum

**IMMEDIATE RESULT:** Mallinckrodt shares dropped by 20% before recovering.

**Steve Balmer**  
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Good job @twitter, @twittermoments innovation, @jack CEO, leaner, more focused. Glad I bought 4% past few months. Like @alwaleedbinT move too

**IMMEDIATE RESULT:** Twitter shares jumped by 5%.

**Hillary Clinton**  
@HillaryClinton  
Follow  
"We need to end private prisons. Protecting public safety...should never be outsourced or left to unaccountable corporations." —Hillary

**IMMEDIATE RESULT:** Two top corrections-company stocks fell 6% and 4%, respectively.

once might have sent an analyst to count cars in retailers' parking lots to inform their earnings models, they're now deploying web-crawling bots to vacuum info from online job-listing sites, Amazon reviews, Wikipedia, Zillow home-value records, FDA patient complaints, and the remotest reaches of the Internet. Investors are "scraping" retailers' online stores for prices and inventory, or nearly buying (then quickly canceling) tickets on Expedia to figure out how many seats are left on every airplane.

Even fintech startups that don't specialize in analytics, such as SumZero, StockTwits, and Scutify, have begun fielding requests from hedge funds wanting to buy their data, such as what stocks their users are searching for, which is seen as a potential proxy for bullishness.

Dataminr doesn't sell a product to individual investors. But social media input is starting to leach into even mainstream websites. For example, Fidelity in November added a "social sentiment" score from Dataminr rival Social Market Analytics to its stock research pages.

**NOT EVERYONE IS A BELIEVER** in the investing value of social media. "There certainly is a lot of skepticism," says Franklin Gold, senior vice president for research and education at Fidelity. Shanta Puchtler, co-chief investment officer at Man Numeric, a division of Man Group, one of the world's largest hedge fund firms, with \$77 billion under management, says his team hasn't been able to glean actionable insights from social media. "There's this romantic notion that Twitter tweets are investable and you can make lots of money if you jump on them," Puchtler says. "You do have to ask yourself the question, 'Where is the value?'"

For all their reach, social media analytics can misfire. One large quant hedge fund got stung when its algorithm confused sarcastic tweets about Lululemon's see-through pants debacle with positive sentiment, buying shares in the yoga-apparel retailer when it should have been selling. "At some point in time, everyone has gotten burned by something that happened on

Twitter," says Joe Gits, CEO of Social Market Analytics.

Early damage to the concept was done by a short-lived British hedge fund, Derwent Capital Markets, which announced it was launching the world's first "Twitter Fund" to much fanfare in 2011, only to shut it down a month later. Derwent's founder, Paul Hawtin, popped up again in the Caribbean in 2013 promoting a new firm with a similar strategy but fell off the radar a year ago.

Dataminr's Bailey says his company is getting better at separating wheat from chaff. But one challenge is perpetual: the eternally changing nature of the crowd on social media. Twitter users join—then deactivate their accounts. They delete tweets. A pattern detected can abruptly disappear. It means that analytics companies must constantly adjust their algorithms and models.

Some early believers fear that Twitter data has become so pervasive that it no longer offers an edge. David Lewis, head Americas trader at \$800 billion asset manager Franklin Templeton, for example, found out that Russia had invaded Crimea last year well before the news hit major media because he'd been

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ONE STUDY SHOWED THAT “AGGREGATE OPINION” FROM TWEETS COULD PREDICT EARNINGS SURPRISES AND MARKET REACTIONS, LEADING TO 5% TO 10% OUTPERFORMANCE.

monitoring Twitter. Since then, though, he says, the social media headstarts have narrowed, and he dropped a trial of a Twitter-based alert system. “News just travels a heck of a lot faster,” says Lewis. “I think those opportunities are becoming more difficult because this data is more widely shared or information is easier to get. No one really has a monopoly on information anymore.”

That’s naive, counters Gene Ekster, a consultant who helps hedge funds implement alternative data strategies. “There is no way you’re going to arbitrage the alpha out of Twitter data,” he says. “It’s crazy to think. You can analyze it in an infinite number of ways.” Still, aware that investors might view it as losing its leg up, Dataminr just launched a custom product—which funds can use to blend its algorithms with their own to get alerts that their rivals won’t have.

**HOW SHOULD** an investor make use of social media data? Here, too, there is disagreement. Those who invest for the long term argue vehemently that, at most, Twitter data is one small piece of a much bigger mosaic. But plenty of momentum-oriented short-term traders seem to be buying and selling purely on social media.

Witness, for example, the way tweets from the real Citron Research recently pounded shares of pharma firms Valeant and Mallinckrodt. (Says Citron’s Andrew Left: “It’s like I’m a Kardashian. People are actually following my tweets. Crazy.”) And within a span of six weeks this fall, Hillary Clinton caused a drop in biotech stocks with a tweet calling for greater regulation of drug prices, then single-handedly tanked stocks of private-corrections companies when she tweeted about prison reform. Then there was the “hash crash” of 2013, when the Dow dropped 145 points in two minutes after someone hacked the Associated Press’s Twitter account and posted, falsely, that explosions in the White House had injured President Obama. “We’re starting to call it the dumb money, because these algos are reacting on the basis of some really stupid stuff,” says Leigh Drogen, CEO of Estimote, which crowdsources corporate earnings estimates.

Still, the studies that have examined this new field so far have largely supported the notion that analyzing social media can be useful in investing. Sentiment as surmised from social media correctly predicted which way the Dow would move three days later 87% of the time, according to a 2011 study by Johan Bollen, an associate professor at the Indiana University School of Informatics and Computing. In July, Eli Bartov, a professor at New York University Stern School of Business and two other researchers found that “aggregate opinion” from tweets before earnings announcements could predict earnings surprises as well as market reactions for individual stocks, leading to outperformance of 5% to 10% per year.

Bollen recently started a company, Guidewave Consulting, to sell the patented signals he describes as “sensing the zeitgeist among investors.” He says those signals have produced the highest returns when computers trade on them automatically, without the second-guessing of a human being.

Web scraping and other alternative data collection practices are already fueling debate over what constitutes nonpublic information and insider trading. SumZero, for one, discovered that one of its users attempted to scrape all the research published by investors on its site, violating the startup’s policies.

Certainly, using technology to gather web data seems innocent compared with, say, cybertheft. But data miners and analytics companies say it’s a finer line than investors often realize; consultant Ekster, for example, says investors can receive cease-and-desist orders for scraping publicly available data. The website for Harvest Exchange, another online investor community, malfunctioned because an algorithm in Florida was checking multiple hedge fund managers’ profiles every 10 seconds to see if they had posted any

potentially market-moving ideas. (The site banned the offending IP addresses.)

The SEC set up its own data-mining unit a few years ago to help it catch market fraud. Social media has complicated that task. “In a world where information travels very, very fast and through different media, figuring out whether information is public or not is challenging,” says Daniel Hawke, the former chief of the SEC’s market abuse unit, who recently joined Washington, D.C., law firm Arnold & Porter.

Perhaps the most poetic example of the power of social media mining occurred in April. That’s when a startup called Selerity, which plumbs the web for earnings reports, detected results for Twitter itself. The information had accidentally been posted an hour early. Within three seconds, Selerity’s bots synthesized the report into less than 140 characters and tweeted it out; four seconds after that the market was moving. Many people accused Selerity of hacking or having been leaked the data (which, according to Nasdaq, was available for only 45 seconds before it was taken down). But Selerity insisted it had merely visited Twitter’s website. CEO Ryan Terpstra points out that anyone with a web browser could have accomplished that: “Just keep clicking ‘Refresh.’”



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## THE MAN BEHIND THE BRAND AND INDUSTRY

*Founded by William E. Cranston Jr., Thermador began as a manufacturer of electric items, most notably portable and built-in heaters. By 1932, Thermador established itself as a high-quality appliance manufacturer. In 1947, Cranston and engineer Fred Pence invented the first built-in wall oven and cooktop and introduced stainless steel to home appliances. Cranston was inducted into the National Kitchen & Bath Association Hall of Fame in 1989, and he is credited with launching the kitchen design industry.*







# COUNTLESS COMBINATIONS OF TRUE PERSONALIZATION

## THERMADOR CULINARY PRESERVATION CENTERS

When it comes to refrigeration, it's no longer about mere preservation; it's about personalization. The Culinary Preservation Centers—a Thermador exclusive—is an elite collection of integrated refrigerator, freezer and wine column configurations that offer countless combinations to fit your unique lifestyle. Discover the next generation of refrigeration and create the ultimate culinary space with unparalleled personalization, peerless design and enhanced luxury.



## A LOOK AT GOOD TASTE

*Get flexibility and versatility with adjustable racks that accommodate a wide assortment of food, all shapes and sizes. Go shallow to contain full-size catering trays, or deep to hold a holiday ham or large turkey. Culinary Preservation Centers deliver good taste, on every level.*



# THE FREEDOM OF FLEXIBILITY

## FREEDOM® COLLECTION WINE COLUMNS

Preserve and age your favorite vintages to perfection with the fully personalized Freedom® Collection Wine Columns. Each column can stand alone, shoulder-to-shoulder, or even venture forth out of the kitchen. Turn a dining room into a wine room, an office into a gentleman's sanctuary, and the home into the ultimate entertaining space. Add in the performance and prowess of dual independent temperature and humidity controls, and the bona fide entertainer has only one question to ask: *Why entertain anything less?*



## OPTIONS THAT RACK UP

*An entertainer's dream comes in two sizes—the 18" or 24" full-height wine column from the Freedom® Collection. Dual temperature and humidity controls allow for storage of both red and white wines. Full extension exotic wood racks not only make a fitting home for your favorite vintage, they hold a variety of shapes and sizes, including that party in a bottle known as Magnum. Your wine column also makes a tempting display case for hors d'oeuvres.*







# THE SWISS ARMY® KNIFE FOR THE CULINARY OBSESSIVE

## THERMADOR PRO GRAND® STEAM RANGE

It's no mere range. No mere oven. The Thermador Pro Grand® Steam Range is a true arsenal for the culinary enthusiast. Boasting quality craftsmanship, peerless design and superior versatility, it encompasses everything to create the ultimate cooking experience. Plus, with exclusive features unmatched in the industry, including ExtraLow® simmering technology, our patented Star® Burner six-range cooktop, SoftClose® doors and 22,000 BTUs of cooking power, this Range is the epitome of versatility and performance in the kitchen.



## HANDCRAFTED WITH PRIDE IN THE U.S.A.

*For over 16 years, our factory in Tennessee has employed highly skilled engineers, designers, welders and craftspeople. They work together to build ranges that define cooking performance — and they do it with an old-fashioned work ethic and unmatched attention to detail.*



# THE SMART COOKTOP WITH A SIXTH SENSE FOR POTS AND PANS

## THERMADOR FREEDOM® INDUCTION COOKTOP

Induction is the most revolutionary advancement in cooking technology within the last 30 years, and the Thermador Freedom® Induction Cooktop is the most revolutionary in its category. Never content to settle, Thermador has re-imagined the possibilities of induction cooking, creating the industry's largest, fully usable cooking surface. The new Freedom® Induction Cooktop offers more responsiveness, more flexibility and the first full-color touch-screen interface that intuitively guides its user. This is the induction cooktop every cook should be excited about.



## TECHNOLOGICAL LEAPS AND BOUNDS AHEAD OF THE COMPETITION

*With 63% more usable space than its closest competitor, the award-winning, technologically-forward Freedom® Induction Cooktop gives you more room to cook what you love.*





# IGNITE YOUR IMAGINATION PERSONALIZE YOUR DREAM KITCHEN

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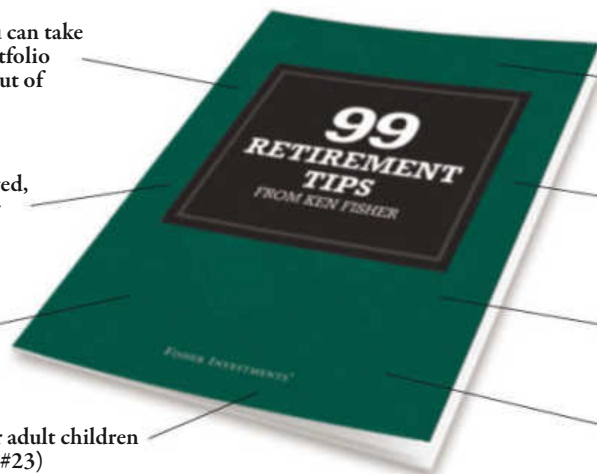
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What you should tell your adult children about your finances. (Tip #23)



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# SILICON VALLEY'S NEW POWER PLAYER: CHINA

BACKED BY BEIJING, DEEP-POCKETED, GLOBE-TROTTING CHINESE VENTURE CAPITALISTS ARE BUYING UP U.S. COMPANIES TO POWER CHINA'S EMERGING CLEAN-TECH REVOLUTION—AND GETTING VERY RICH IN THE PROCESS. HOW AMERICAN TECHNOLOGY IS SCALING UP ON THE OTHER SIDE OF THE PACIFIC.



Don Ye, founder of Tsing Capital, standing near his home in Beijing



—  
**BY  
JEFFREY  
BALL**

PHOTOGRAPH BY MARK LEONG



Sonny Wu, here in Hong Kong, also has luxury homes and offices in Beijing and Silicon Valley.

# ONE OF SONNY WU'S FAVORITE RESTAURANTS IN THE CITY WHERE HE LIVES IS A VENERABLE

wood-paneled haunt in central Hong Kong where the waiters wear black bow ties and the menu melds comfort food from the East and West. On a recent Sunday evening, dressed in jeans, an untucked red-and-white checked shirt, and a gold Patek Philippe watch, Wu, a 47-year-old venture capitalist, is attacking dinner in much the same way he attacks whole industries these days: He sits quietly in a corner, snaps up

a range of options, and gorges himself.

As he demolishes a platter of barbecued chicken wings and washes it down with hot tea, Wu explains why he's racing to corner two sectors he believes are primed for explosive growth: LED lights and electric cars. In March, Wu scored his biggest win yet. He beat out such suitors as KKR and Bain & Co. for a \$3.3 billion purchase of 80% of Philips' Lumileds unit, one of the world's leading LED-light makers. Now he's preparing to move the California-based arm of the Dutch multinational to China, where he is building factories to scale up the business.

A similar strategy led him in 2011 to buy control of Boston Power, a Massachusetts battery maker that boasted advanced technology but couldn't commercialize it. He moved the company to China, and then, in 2014, he bought a stake in a little-known Chinese electric-car maker, Xindayang, which today is cranking out bulbous, brightly colored electric cars with Boston Power batteries under the hood. The company has sold about 32,000 electric cars this year—each for about \$10,000.

Xindayang's growth trajectory, Wu claims, puts it on track to soon sell many more cars than Tesla Motors, the California-based maker of luxury electric vehicles that, along with its CEO, Elon Musk, is a

global sensation. “Elon Musk is sexy, but Elon Musk is not changing the world,” Wu declares, his fingers glistening with barbecue sauce. “Let’s be frank. The guy who’s making the \$100,000 car is not changing the world. The guy who is making the \$10,000 electric vehicle is changing the world.”

He pauses, then grins. “You cannot have caviar every day. You have to eat chicken wings.”

Wu—part Chinese, part North American, all audacity—is the model of a new breed of global high-tech financier. He grew up in China and Canada, dropped out of graduate school at the University of California at Berkeley, and speaks unaccented Mandarin, Cantonese, and English. He has luxury homes and offices in Beijing, Hong Kong, and Silicon Valley, and he acts like a local on both sides of the Pacific—a body of water he treats essentially as a puddle, hopping across and back, first-class, more than a dozen times in a typical year. A chauffeur in Beijing ferries him around in a Porsche Cayenne, the desk manager of Shanghai’s five-star Jing An Shangri-La Hotel knows him by name, and Wall Street’s biggest banks now recognize him as a serious player.

The brash investor is quickly amassing an empire that, bankrolled in part by his friends in the Chinese government and among China’s billionaire set, is snarfing up technology companies from across the U.S. and around the world. His strategy is simple, unsentimental, and a sign of the times: Buy Western companies that have good technologies but poor domestic growth prospects and bring them to China, where Wu and his contacts serve up the money and the market to help the firms grow very big, very fast.

China, the world’s biggest polluter, is racing to clean itself up. The skies above its cities have become so poisonously smoggy that what started as a public-health danger has become, for China’s ruling regime, a political threat. That’s why Beijing is cracking down on pollution. The country’s leaders are mandating improved efficiency for coal-fired power plants, rolling out fat incentives for renewable energy and electric cars, and advising government-affiliated banks to help finance this power shift. At the same time, the country sees clean-energy technologies as a huge new market. Just as China cornered the manufacture of T-shirts and televisions a generation ago, so it is moving to dominate the production of electric cars and solar panels in the near future.

In the U.S., China’s clean-energy push elicits both praise and terror. Environmentalists laud it, arguing that only if China, the world’s biggest greenhouse-gas emitter, goes green will the world have any chance of solving climate change. Nationalists decry it, fearing that China is snagging American clean-energy technologies that could, in the fullness of time, look like lost crown jewels. As for the Silicon Valley entrepreneurs developing these technologies, they’re simply seeking capital to fund their ventures—and finding that increasingly it comes from China.

Stephan Dolezalek, a managing director at California’s VantagePoint Capital Partners and a veteran Silicon Valley clean-energy investor, sees in the trend the reality that China—its government and its investors—are hungrier to scale up clean energy than the U.S. is. “We’re stuck with a perfectly okay system. We’re stuck with incumbents trying to protect their stakes. We’re actually aggressive in trying to stop it from taking hold in the U.S.,” says Dolezalek, who in 2012 helped sell Silicon Valley solar-panel maker MiaSolé, a firm VantagePoint had invested in but couldn’t commercialize, to Hanergy, a Chinese hydropower conglomerate. Against this backdrop, the Chinese are responding sensibly, Dolezalek says. “They’re saying, ‘Great. We’ll just do it.’”

Middlemen like Wu are springing up to grease this transpacific money flow. Equally at home in Shanghai and San Francisco, these investors are arbitraging the gap between America’s clean-energy know-how and China’s clean-energy need. Their center of operations typically is Beijing, where they have friends in high places. But it would be wrong to see them merely as arms of the Chinese state. Like opportunistic investors everywhere, they raise money wherever they can get it. Much of their capital comes from Europe, Japan, and the U.S.

Their game shows little sign of slowing. The Shanghai stock market, which was cratering the week I dined with Wu in China, has since been rebounding. The U.S. presidential race is likely to whip up American anti-China rhetoric—elections typically do—but the politicking won’t change the financial reasons beckoning U.S. entrepreneurs to China. And whatever the outcome of a round

**“CHINA’S  
ENVIRONMENT  
NOW HAS  
CANCER,”  
SAYS  
ONE CHINESE  
VENTURE  
CAPITALIST.  
“BUT CHINA  
HAS LOTS  
OF CASH.”**

**CHINA'S  
CLEAN-TECH  
SHOPPING  
SPREE**

CHINESE INVESTORS HAVE BEEN BUSY BUYING UP U.S. COMPANIES. HERE, FIVE NOTABLE DEALS:

1

CHINESE INVESTOR:  
GSR Ventures

U.S. COMPANY:  
Philips' Lumileds unit

SECTOR:  
Lighting

DEAL  
Earlier this year, Chinese VC firm GSR orchestrated a \$3.3 billion buyout of Philips' California-based Lumileds LED-light unit. A key part: \$1.9 billion in debt from the Bank of China.

of global climate-change negotiations in Paris that was underway as this article went to press, China and the U.S. will need each other to follow through on promises they've made to curb the amount of carbon dioxide they cough out.

## BUILDING A FOUNDATION

**C** HINESE MONEY has been trickling into Silicon Valley for years. But lately the flow, particularly into clean-energy technologies, has opened up. An ecosystem of Chinese-funded high-tech incubators is sprouting in the Valley. Bankrolled by a mix of Chinese individuals, corporations, and municipal and provincial governments, they're giving U.S. companies space to grow—and a clear path to do it in the biggest clean-energy market on the planet.

One of Silicon Valley's first Chinese-funded incubators, called InnoSpring, opened in 2012 in a stucco-and-glass office park in Santa Clara, Calif., across a highway from Levi's Stadium, home of the San Francisco 49ers. InnoSpring's funders include Wanxiang Group, a Chinese auto-parts giant that in recent years has bought such U.S. companies as Fisker, an electric-car maker, and A123, a battery developer.

InnoSpring's pitch to U.S. companies is clear. "We are here because we can take them to China if they want to go," says Wanfeng Liu, InnoSpring's Shanghai-based president, on one of his recent visits to Santa Clara.

Some 20 Chinese-funded technology incubators dot Silicon Valley today. Most were opened in the past three years, estimates Ping Wu, who helped conceive of InnoSpring as well as one of its newer rivals, called SVC Angel. (The "SV" stands for Silicon Valley, and the "C" stands for China.)

SVC is essentially a loose club of Chinese investors pouring money into Silicon Valley, and it has what amount to two brand-new clubhouses. There's an incubator for entrepreneurs, housed in a Santa Clara office. In typical Silicon Valley fashion, the blacktop looks like a joint BMW and Mercedes new-car lot, and the office is crammed full of communal tables where young people on whimsically colored chairs hunch over laptops.

Then there's the group's more sober base for investors, about 25 miles northwest of Santa Clara,

in Belmont, Calif. It's in a building overlooking San Francisco Bay that once was the first headquarters of Oracle, the software giant. The space is a collection of glass-walled offices, each with a sign identifying the company using it. "All these are Chinese funds," says a proud Don Ye, an early investor in SVC Angel, whose second-floor corner office has by far the facility's best waterfront view.

## LIVING IN A MIDDLE ZONE

**I** F THERE'S AN ELDER statesman of Chinese clean-energy venture-capital investing, Ye, the 51-year-old founding partner of the Beijing firm Tsing Capital, is it. His first fund, which he struggled to raise in 2002, when he was just 38, had \$13 million. The fund he closed in 2012 had \$282 million. His investors have included some of the biggest names in global finance: multinationals such as BP, BASF, ABB, and Mitsui; development institutions such as the World Bank's International Finance Corp.; European pension and sovereign-wealth funds; and family offices, including that of Eric Xu, co-founder of Chinese web-search engine Baidu. In his Beijing office, in a room with a massive tea set where Ye receives visitors, a credenza holds photos of Ye with an array of luminaries, including Al Gore.

Now Ye is raising a fifth fund, for which he's targeting \$350 million. The money is chasing fixes for China's monumental environmental ills, and Ye and his partners plan to invest much of it in Western tech companies, particularly those from the U.S. that they hope to scale up in China. "China's environment now has cancer," Ye says. "But China has lots of cash."

The venture business has been good to Ye. As he decried China's polluted air and rivers, he was sitting under a gorgeous blue sky, sipping tea by the backyard pool of his vacation home in Woodside, Calif. The house has a clear view of San Francisco Bay, solar panels on the roof, and a Mercedes SUV that retails for \$90,000 sitting in the garage alongside a Chevy Volt. Strung between trees in the backyard were multicolored flags, each with a different sutra, or aphorism in Buddhism, the religion that Ye took up a few years ago. Ye has a Buddhist master from Tibet as a personal teacher, and one morning as he and I speak by the pool, the guru sits at the kitchen table, quietly eating breakfast. Earlier in the year Ye had hosted a July Fourth fireworks-watching party; he plans to make it an annual tradition.

Ye always seems to be in a middle zone between China and the U.S. “Hello?” he says by the pool at one point, answering one of the two mobile phones sitting on a table beside his tea cup. “I mean, *Wei*?” he adds, proffering the traditional Mandarin phone greeting once he realizes the caller is Chinese. The call is about a Silicon Valley investment of Ye’s that’s proving difficult: Atieva, a company racing to develop a luxury electric car.

Atieva was founded in 2007 by Bernard Tse, an engineer who the year before had left Tesla, where he was a vice president and board member. From the start the company was focused on China, where government has rolled out generous subsidies for electric cars. In 2009, Tsing Capital invested \$8 million in Atieva. The startup later raised additional money—with help from Tsing—including a \$200 million round that closed in 2014, with virtually all the money coming from China. The biggest chunk, \$100 million, came from Beijing Automotive Industry Holding Co., or BAIC, a state-owned company that’s one of China’s largest automakers.

Ye invited me to visit Atieva to meet Tse, the CEO. But when I got to the company’s headquarters, a squat building in an industrial section of Palo Alto, Tse didn’t want to talk. A potential explanation for his reticence emerged a few days later. Atieva’s board met, and a session scheduled to take two hours lasted many more because of friction about the company’s direction, reported Ye. Atieva and several of its investors regard themselves as competing against one another to get an electric car onto the road. They are, Ye says, “all in the same pot.”

A couple of weeks later, I headed to China. In Beijing, I went with Ye to BAIC’s headquarters, a building designed by a German architect that’s clad in metal and looks like a ship, with halls as long and shiny as bowling lanes. Sitting alone in an office, I could hear people approaching, because their rubber-soled shoes padding against the floor made an ever louder “swish, swish.”

The BAIC investment in Atieva envisions a joint venture in which BAIC will open a factory in China to build Atieva cars. BAIC already makes its own electric vehicles; it sold 5,510 of them in 2014, a tiny fraction of its total sales of 2.4 million passenger vehicles. But BAIC has plans to boost electric-vehicle production. Part of its strategy is to build an Atieva car that’s faster, lighter, more luxurious, and able to go farther on a charge. The goal, I was told, is for Atieva’s car to compete against Tesla’s Model S.

## SCALING UP AT CHINA SPEED

**C**HINA REPRESENTS the commercialization strategy for another of Ye’s Silicon Valley clean-energy investments: Sunpreme, which developed, in Sunnyvale, Calif., an innovative way to make efficient solar cells. Ashok Sinha, Sunpreme’s CEO, founded the company in 2007 after a career that included two decades at Bell Laboratories and several years at Applied Materials, a prominent Silicon Valley maker of equipment for the computer-chip industry.

Sinha had spent significant time in China, which was fast becoming the center of the global solar industry. He knew he wanted to locate his factory there. In November 2009, at a dinner for several of its portfolio companies that Tsing held on Lamma Island—part of the Hong Kong archipelago—an attendee from Jiaying, a city about 90 minutes west of Shanghai that was embarking on an aggressive program to install solar panels on rooftops and streetlights, suggested that Sinha put his factory there.

What happened next, Sinha recalls, was textbook China. Negotiations with Jiaying officials began almost immediately. “In March we had the deal. In May we had the opening ceremony. And by the end of Christmas, we had product coming out,” he says. “This speed is unheard-of. It would not have happened anywhere else in the world.”

Jiaying and the surrounding province of Zhejiang gave Sunpreme incentives that Sinha values at about \$5 million. On a recent Saturday morning—Saturdays are workdays at Sunpreme’s China factory—the scene on the processing floor looks like a cross between Willy Wonka’s chocolate factory and Dr. No’s underground lair. A solar-cell production line is largely a series of furnaces, each baking various coatings onto a piece of silicon that improve its ability to turn sunlight into electricity. At Sunpreme, workers dressed head to toe in white jumpsuits scurry around in a carefully orchestrated ballet, ferrying racks of silicon slices from one machine to another. The chemistry of the coatings that Sunpreme adds to the silicon slices, and the precise way it applies those coatings, are the company’s secret sauce.

Sinha, the CEO, has spent the past few months flying around the world in search of some \$250 mil-

2

CHINESE INVESTOR:  
Wanxiang Group

U.S. COMPANY:  
Fisker Automotive

SECTOR:  
Electric cars

DEAL:  
In 2014, Chinese auto-parts maker Wanxiang paid \$149 million to buy the electric vehicle company out of bankruptcy and rebranded it this year as Karma Automotive.

3

CHINESE INVESTOR:  
Wanxiang Group

U.S. COMPANY:  
A123 Systems

SECTOR:  
Batteries

DEAL:  
Wanxiang bought battery maker A123’s main businesses for \$257 million in 2013, after A123 filed for bankruptcy.

4

CHINESE INVESTOR:  
Hanergy Holding Group

U.S. COMPANY:  
MiaSolé

SECTOR:  
Solar

DEAL:  
Hanergy, a major Chinese hydropower producer, paid a bargain-basement price of \$30 million in 2012 for MiaSolé, a Silicon Valley-based maker of "thin-film" solar cells.

5

CHINESE INVESTOR:  
GSR Ventures

U.S. COMPANY:  
Boston Power

SECTOR:  
Batteries

DEAL:  
In 2011, GSR led a group that bought control of battery maker Boston Power for about \$125 million and relocated it to China.

lion to balloon Sunpreme's production capacity by a factor of about 25 over the next two years. Sunpreme, he says, is in advanced talks with multiple parties, including one of the world's largest solar players: Sun Edison, based in California, whose stock has taken a recent drubbing. Officials in New Mexico and Virginia also have met with Sunpreme to try to woo the company's new factory, Sinha said.

But though each of those states has discussed with Sunpreme a grant of more than \$10 million, their incentives pale against the deal being dangled by Suzhou, a Chinese city not far from Jiaxing that has built considerable solar-manufacturing infrastructure. Suzhou officials have lined up millions in Chinese bank loans for Sunpreme with an interest rate of 4%, a fraction of what Sunpreme would have to pay in the U.S. "That," Sinha says, "is good money."

## TAKING ON TESLA

**I F DON YE IS THE DIPLOMATIC** ambassador for China's clean-energy venture capital community, then GSR's Wu is its grand strategist. Wu, who holds stock worth hundreds of millions of dollars, likes expensive French wine, fast German cars, and big global deals. "The future of clean-tech manufacturing is in China," he says confidently. "The U.S. can try to block it; it doesn't matter. It's all about competitive advantage."

Born in 1968, Wu grew up in China. In 1981, soon after Deng Xiaoping, then the Chinese leader, normalized relations with the West, Wu's parents, both teachers, moved with their 13-year-old son to Vancouver. Wu went to college in Canada—his passport is still Canadian—and he enrolled in a Ph.D. program in physics at Berkeley. He dropped out when he concluded that, as he puts it, "I wouldn't have a chance of winning a Nobel Prize."

Soon after he took a job at Nortel, the Canadian telecommunications and semiconductor giant. He returned to China for Nortel, then later left the company to launch a startup. In 2004 he started GSR. It stands for Golden Sand River, one of three waterways that originate in China's Yunnan province and wend their way into neighboring countries. Only the GSR returns to China. The metaphor fit Wu's investment thesis.



Electric-car designer Henrik Fisker introduced a new model in November 2014. Fisker Automotive was bought in bankruptcy in early 2014 by China's Wanxiang Group.

GSR's first fund, closed in 2005, totaled \$75 million. A decade later GSR's war chest is about \$2 billion, and the firm recently announced its intent to raise as much as \$5 billion. Wu's non-Chinese investors have included the World Bank and Holland's AlpInvest Partners. GSR's office occupies much of the 56th floor of the China World Trade Center Tower III, an 81-story skyscraper that is now Beijing's tallest building.

When it enters into a deal, GSR does more than invest its own money. It taps its contacts in government in China and at other investment entities to pile on their money too. A case in point is GSR's bid to dominate electric cars.

A tentpole of that strategy is Boston Power, founded in Massachusetts in 2005 by a former battery-industry consultant seeking to make high-efficiency lithium-ion batteries for notebook computers. The company soon was squeezed, says Richard Chamberlain, Boston Power's longtime chief technology officer. Battery prices were declining, "and we had no manufacturing scale."

In 2011, Boston Power took two big steps. It shifted strategy to target its batteries toward vehicles instead of computers, because "we saw big government subsidies" rolling out in China for electric cars, Chamberlain says. And as part of that shift, it accepted an investment from GSR. The move sparked concern in the U.S. that China was snapping up a valuable American technology. Wu rejects that worry. "We saved the company from bankruptcy," he says.

GSR has put some \$50 million of its own capital into Boston Power. Investors GSR helped bring in, including prominent firms from the U.S. and Europe as well as private and government-affiliated parties from China, have since added over \$300 million. In addition, GSR helped arrange a package of subsidies for the battery company to defray the cost of building a commercial-scale factory in Liyang, a city west of Shanghai. Among those subsidies: The local government agreed to build the factory and gave the company several years to pay the cost back.

FREDERIC J. BROWN—AFP/GETTY IMAGES

By mid-2013, the facility was up and running.

Then, in 2014, GSR invested in Xindayang, the Chinese EV maker. GSR has put about \$15 million of its own money into the company so far. Xindayang began in 2001 as a manufacturer of motors and controllers for electric bikes and scooters. In 2012, wanting higher margins, Xindayang started cranking out inexpensive electric cars. The new vehicle was hatched with the help of designers in Italy. But its curvy lines couldn't hide the limitations of its battery, a Chinese model that could power the car only about 75 miles on a charge.

Boston Power now sells most of its batteries to Xindayang, which markets its cars under a joint venture with Zhejiang Geely Holding Group Co., the Chinese automotive giant that also owns Volvo. The Boston Power battery boosts the car's range to about 110 miles on a charge. That's not just more convenient for a driver. Crucially, it means the car qualifies for the highest level of consumer subsidies under a new round of electric-car incentives China recently rolled out. That car retails for about \$23,400, but the subsidies slash the price a consumer pays to about \$9,300. Xindayang is aiming to sell 300,000 vehicles by 2020, says Shu Bin Zhang, a Xindayang manager who shows me around the factory one afternoon. Says Wu: "Whatever the number is, it's going to be more than Tesla."

The car itself is no Tesla. It's advertised as going from zero to 30 miles per hour in seven seconds. When I take it for a spin on the lot surrounding Xindayang's factory in Shandong province and floor it, I clock it at 10 seconds, and that acceleration produces a harsh rattle in the car's rear end. Still, Zhang notes, "most people can afford it."

Largely on the back of Xindayang sales, Boston Power, still a small player in the battery industry, is struggling to expand production. Its factory in Liyang, says Chamberlain, is producing at much less than its capacity. "Some things aren't working as well as they should be," he says.

But GSR is barreling ahead. It's talking to government officials in Tianjin, an industrial city southeast of Beijing, hoping for an incentive package that would lure Boston Power's next plant there.

All of which means Boston Power's future is firmly in China, the biggest auto market in the world. Chamberlain, whose Boston roots are audible every time he opens his mouth, says it's hard to imagine his company growing nearly as fast back home: "It would be very hard in the U.S."

## FORMING A MASTER PLAN



**U'S GRANDEST MOVE** yet was his come-from-behind buyout of Philips' Lumileds lighting unit in spring 2015.

If any observers doubted before that deal that Wu is for real—and plenty of players did, including Philips and its chief investment banker in the transaction, Morgan Stanley—they don't doubt him anymore.

Wu's team beat out the likes of KKR and Bain essentially because it wagered it could wring more profit from Lumileds' technology—a bet based on a calculation that it could tap its extensive China contacts to ramp up Lumileds' production hard and fast. Wu's team assembled a slate of investors, most of them from China, who collectively put up about \$1.3 billion in equity. It also got the Bank of China to fork over some \$1.9 billion in debt—at 3% interest, well below market rates.

Now, finalizing the deal depends on approval by the Committee on Foreign Investment in the U.S., known as CFIUS, a federal entity that can block U.S. asset sales to foreigners if CFIUS concludes those sales would jeopardize national security. Wu is working a Washington strategy to win CFIUS approval. Meanwhile, he's already begun building the first of what he expects will be several Lumileds factories in China.

Like a chess master watching his strategy unfold, the venture capitalist can see his global plan coming together perfectly. "Every element for LED lighting is under our control. Every element for electric cars and electric batteries is under our control," Wu tells me triumphantly one afternoon.

He is sitting in Shanghai, sipping a cool drink by a corner window in the executive club on the 55th floor of the Jing An Shangri-La Hotel. Then he pauses. "Maybe I'm too arrogant. Maybe I'm too ambitious," he volunteers, though it seems more out of politeness than because he really has doubts. China's sky is notorious for darkening quickly. On this day, however, the view of the country that calls itself the Middle Kingdom is pretty clear. As Wu gazes out the club's floor-to-ceiling windows, he can see, in many directions, for many miles. ■

# HARNESSING THE ENERGY OF THE EARTH

**GEOTHERMAL SOURCES OFFER SUSTAINABLE, AFFORDABLE,  
AND CONSTANTLY AVAILABLE HEATING AND COOLING.**



Three kinds of loop systems include (1) horizontal, (2) open, and (3) vertical. Horizontal loops sit four to six feet below the surface. Open, or well-water, loops use existing water wells in lieu of pipes in the ground. Vertical loops extend downward instead of outward.



## GEOTHERMAL ENERGY

sources underground are increasingly providing energy for residential and commercial structures in the U.S. In New York City, geothermal systems have been installed in buildings ranging from the Brooklyn Children's Museum to the Times Square TKTS booth. After Hurricane Sandy destroyed large swaths of the New Jersey shoreline in 2012, some homes and buildings replaced their oil tanks with geothermal systems—an accelerating trend. Cost-efficient, reliable, and sustainable, geothermal is the rising hero of alternative energy in the U.S.

This modern energy source is generated by tapping into reservoirs of heat beneath the surface of the earth, mostly caused by the decay of naturally radioactive materials. In fact, the heat within 10,000 meters of earth's surface contains about 50,000 times more energy than all oil and natural gas resources in the world, according to *The Energy Report*.

Not only one of the most renewable power sources on the planet, geothermal is also constantly available—allowing homeowners to tap into the earth's natural heat without interruption. Ancient Romans used it to heat their homes; today it powers about 85% of homes in Iceland, according to the School for Renewable Energy Science. While geothermal's share of U.S. heating and cooling systems has remained at 0.4% since 2001, Chris Namovicz of the U.S. Energy

Information Administration predicts it will enjoy “slow but steady growth over the next 20 years.”

For homeowners who want to save money and reduce their carbon footprint, geothermal power offers clear-cut benefits. Almost half of an average home's power consumption goes to heating and cooling. Ground heat pumps—versatile, and feasible even in urban settings—typically shave hundreds of dollars off annual energy costs, according to the U.S. Department of Energy, which estimates that the residential technology can pay for itself in five or fewer years with tax credits (or eight to 10 years without).

“This is really harnessing the earth's natural energy,” says Matthew Pine, vice president of marketing at Carrier, the top manufacturer of heating, cooling, and refrigeration systems. The company is an industry leader with its geothermal units based on ground-heat pumps.

Six feet below ground, Pine explains, the earth maintains a temperature of 50 degrees. Carrier's geothermal heat pumps use loop systems to tap into that thermal energy. “Our solutions are affordable and effective. We've found that consumers can cut their heating bills by up to 70%,” says Pine.

Twenty years ago, Carrier's parent, UTC, became one of the first companies to begin setting and measuring sustainability goals in its annual report. It's an imperative that Carrier continues to embrace. “Consumers care about the environment,” says Pine. “So do we.” ●

# Unearth Efficiency, Savings and Comfort Control With Infinity® Geothermal Systems From Carrier.

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ANNUAL  
HEATING AND  
COOLING  
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TO 70%<sup>1</sup>

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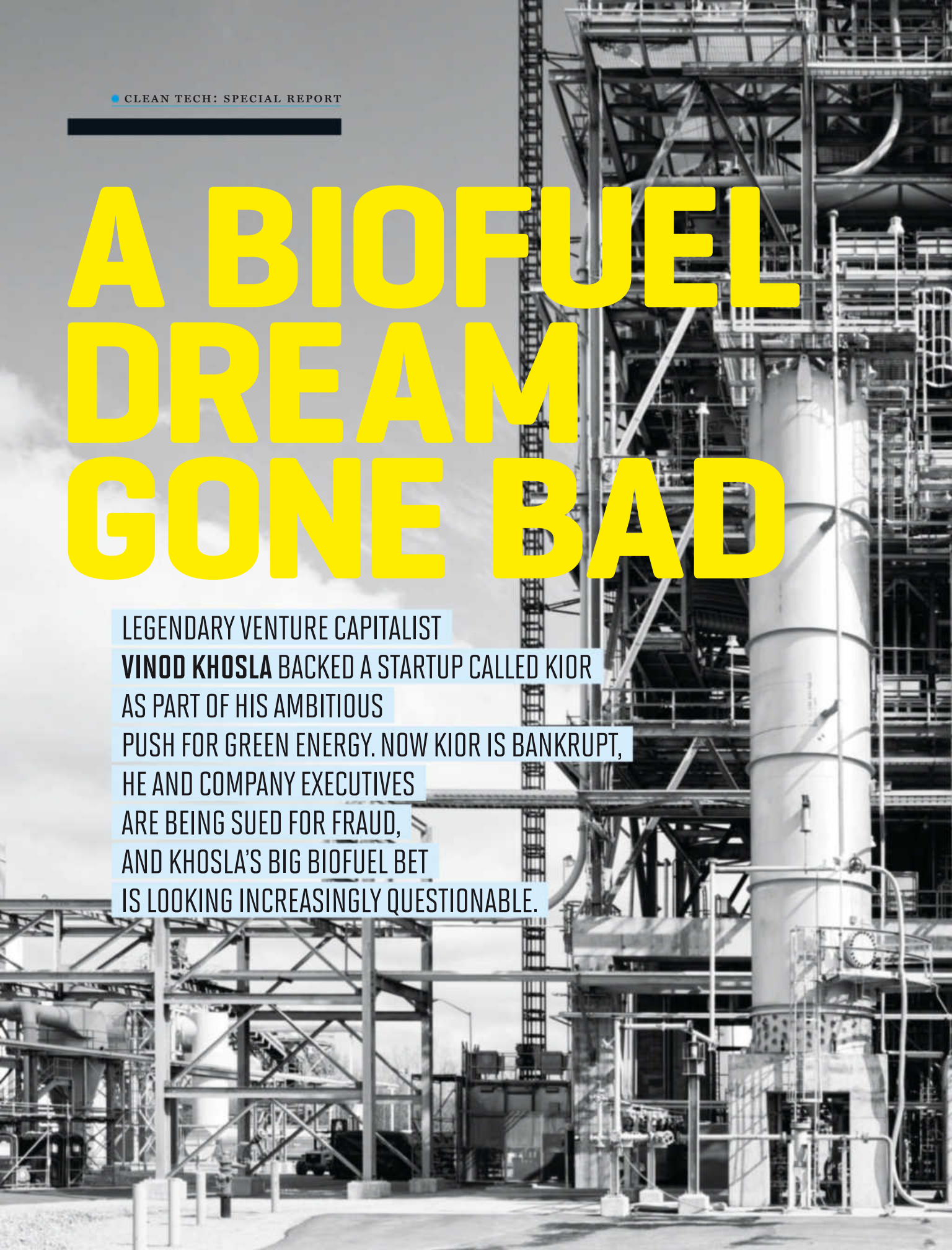


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<sup>1</sup>Savings calculated using Carrier's LoopLink software. Comparison based on simulation in Dallas, TX. Carrier 6-ton unit vs. standing pilot propane furnace, standard air conditioner and local fuel rates. Actual savings will vary based on configuration, weather and local energy costs.  
<sup>2</sup>[https://www.nvenergy.com/brochures\\_arch/conervation/environmentandheatpumps.pdf](https://www.nvenergy.com/brochures_arch/conervation/environmentandheatpumps.pdf)

# A BIOFUEL DREAM GONE BAD

LEGENDARY VENTURE CAPITALIST  
**VINOD KHOSLA** BACKED A STARTUP CALLED KIOR  
AS PART OF HIS AMBITIOUS  
PUSH FOR GREEN ENERGY. NOW KIOR IS BANKRUPT,  
HE AND COMPANY EXECUTIVES  
ARE BEING SUED FOR FRAUD,  
AND KHOSLA'S BIG BIOFUEL BET  
IS LOOKING INCREASINGLY QUESTIONABLE.





KiOR's facility in  
Columbus, Miss.,  
photographed  
in 2013



**BY KATIE  
FEHRENBACHER**

PHOTOGRAPHS BY TY COLE

# DRIVE A COUPLE OF HOURS NORTHEAST OF JACKSON, MISS.—MANEUVERING PAST SEMITRAILERS PILED WITH TIMBER ON HIGHWAYS LINED WITH DENSE PINE FORESTS—AND YOU’LL REACH A SPRAWLING STRUCTURE OF METAL PIPES AND TOWERS.

It’s a factory in the sleepy city of Columbus, Miss., that was briefly able to turn wood chips into a biofuel that could power vehicles more cleanly than oil, using a first-of-its-kind technology that wowed engineers, politicians, and investors.

The plant’s supporters once envisioned it as the embodiment of a clean-energy future. The company that owned it was valued at more than \$1.5 billion, and its shares publicly traded. The factory, the first of several planned in the state, was intended to employ hundreds of workers and create new demand for the state’s timber industry.

KiOR was a crown jewel in the aggressive biofuel portfolio of billionaire venture capitalist Vinod Khosla.



But on a hot, sunny afternoon in October, the factory is a dead zone. Long weeds have sprouted up around an empty parking lot. No workers are operating any machinery. The plant hasn’t produced any biocrude in close to two years. Days before, a big chunk of the facility was sold for \$2.1 million. Another piece was unloaded weeks before that for \$1.6 million. The plant, a former paper mill, had cost more than \$215 million to buy and convert to green energy production.

The factory was run by a company called KiOR, which was once a symbol of the promise of the next generation of biofuels and the role that Silicon Valley and government could play in incubating clean-energy technology. Its soaring ambitions—and hype—largely stemmed from the imprimatur of Silicon Valley venture capitalist Vinod Khosla and the millions he had invested in it. All told, the company spent more than \$600 million. In its brief time in operation, it generated \$2.3 million in revenue; when it filed for bankruptcy it listed assets of \$58.3 million.

At one time KiOR was an important company for Khosla, whom *Fortune* called “the most successful venture capitalist of all time” in 2000. He’s a billionaire who moves in rarefied circles; he hosted a dinner for President Barack Obama at his home a few years ago. In 2004 Khosla left the elite venture capital firm Kleiner Perkins Caufield & Byers. He launched Khosla Ventures partly because he wanted to make an outside bet on clean technology. The next generation of biofuels, made from plants and biowaste (so-called cellulosic materials), which have lower carbon emissions than oil, were a particular passion. Khosla invested hundreds of millions of dollars in about a dozen biofuel and biochemical companies.

His ambitions were audacious. Khosla declared “a war on oil.” As he wrote in 2006, “I believe we can replace most of our gasoline needs in 25 years with biomass.” He dismissed incumbent energy companies in a 2007 interview as not investing



heavily in biofuels because they weren't "used to innovation and the rate of innovation we are likely to see in this business."

KiOR was a crown jewel in Khosla's biofuel portfolio. Khosla Ventures held 75% of its voting shares at one point and wagered nearly \$160 million, much of it Khosla's own money. He attracted a constellation of names. Former Secretary of State petro Rice joined KiOR's board. Later, tech magnate Bill Gates, who has invested in Khosla's funds and shares his interest in energy tech, committed millions. Former U.K. Prime Minister Tony Blair joined Khosla Ventures as a senior adviser in 2010, partly to counsel clean-tech startups.

Yet only 2½ years after a gala groundbreaking, KiOR's Mississippi facility, riddled with problems, stopped producing biofuels. Eleven months after that, in late 2014, the company filed for bankruptcy.

Unlike most failed startups, KiOR hasn't just shut its doors and disappeared into oblivion. Today recriminations, investigations, and litigation continue to surround it. The Securities and Exchange Commission has been examining whether the company made false statements, including on a critical point: the yield of its biofuel (the amount that can be made per ton of wood chips). Two KiOR executives and Khosla himself are also

facing a class action suit alleging that company executives misled investors about production volumes and yield.

The state of Mississippi is also suing Khosla and key KiOR executives on similar grounds, claiming they hoodwinked the state to obtain a \$75 million loan. The case provides a striking image. One of the poorest states in the country, which received only \$6 million of its money back before KiOR went bankrupt, is seeking to collect from a Silicon Valley billionaire. In the suit, Mississippi Attorney General Jim Hood described KiOR as "one of the largest frauds ever perpetrated on the State of Mississippi." The state development agency called for KiOR to be liquidated and accused the company of manipulating the bankruptcy to give Khosla a better deal on the assets. KiOR countered by accusing the state of a "scorched-earth litigation strategy" that scared away potential buyers of the Columbus plant.

This past summer a judge approved KiOR's Chapter 11 plan: The company sold itself to an affiliate of Khosla's, trading \$15 million in debt for

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BIOMASS,"  
HE ASSERTED.**



Mississippi Attorney General Jim Hood took on other companies before KiOR.

equity, and receiving \$29 million in exit financing. The plan enables KiOR, which had about 70 employees in its Texas headquarters as of the summer, to conduct research for at least a year and figure out how to make its biofuels at a larger scale. KiOR's supporters say the core tech is still valuable and could someday be ready to commercialize.

Today many of the other biofuel startups that Khosla Ventures backed over the years have either shut down, been sold for small sums, diversified, or migrated to making bio-based materials and specialty chemicals. Khosla has argued that the stakes for the planet are so high when it comes to energy that the potential benefits easily justify the costs of flops (which, as with all venture investments, are numerous). In one blog post in 2014, he wrote that "to get to the energy-independent future we need, we must continue to try and sometimes fail, but the consequence for not trying is guaranteed failure. We will keep accepting intelligent and selective failure."

Khosla and KiOR declined multiple requests for interviews for this article, but court filings for both deny any fraud or deception. In the past, Khosla has acknowledged that at least half his green-energy businesses would fail.

How KiOR crashed so disastrously is a complex saga. The company struggled—and ultimately failed—to deliver the yields it needed. It faced constant technical problems at its factory. It was buffeted by outside forces, including a worsening environment for green-tech financing and a dras-

tic fall in oil prices. All of that was enough to kill off plenty of biofuel startups.

But KiOR's woes were compounded by hubris and overweening ambition. It has become perhaps Silicon Valley's favorite cliché to rhapsodize about the virtues of "failing fast," and KiOR certainly accomplished that. But what is the practical lesson of that failure—that inventing new biofuels is even harder than it looks? Or that fast-moving venture capital investors are ill-suited to tackle such a technically demanding, time-consuming endeavor?

## THE MAGNOLIA STATE

**M**ISSISSIPPI ATTORNEY GENERAL Hood is determined to hold Khosla and KiOR's executives accountable. In an interview in his office on the 12th floor of the Walter Sillers State Office Building in Jackson, he says, "You can't come into a poor state like this and gamble on \$75 million of our money, and expect to go into bankruptcy court and walk away."

A native of Chickasaw County in northeastern Mississippi, Hood has been a prosecutor for 25 years. He initiated the KiOR suit after lawyers obtained close to 400,000 pages of documents through the company's bankruptcy case. Those documents, he says, show that the individuals involved "knew when they brought this proposal to us that their technology was incapable of producing the product that they claimed it would."

Hood isn't the first Mississippi attorney general to wage a populist campaign against an out-of-state company. One predecessor was instrumental in extracting a \$246 billion settlement from tobacco companies in the 1990s. During his tenure, Hood has taken on corporations ranging from MCI WorldCom to Google and Microsoft. He sometimes retains contingency-fee law firms to sue companies, as he did in the KiOR suit, which saves the state money. Hood has received hundreds of thousands in campaign contributions from plaintiffs lawyers who handle cases for the state.

Seven floors above Hood's office is the governor's office. It was there that the state's deal with KiOR was struck. On July 1, 2010, a group of 10 representing KiOR, the state, and Khosla Ventures met to discuss a loan. Hood says he happened to bump into the group on their way in.

The two most powerful men in the room were Khosla and Haley Barbour, then governor, who

combined Washington savvy (he co-founded a major lobbying firm), a national presence (he is the former head of the Republican National Committee), and the molasses drawl of his hometown, Yazoo City, Miss. The two were introduced in 2008 at Teddy Forstmann's annual Aspen conference and had discussed bringing a high-tech "smart" window maker called View (then known as Soladigm) to the state.

Barbour was interested in attracting new jobs to the state, which routinely ranks at or near the bottom in economic development metrics. Clean energy was particularly appealing because it often brought support from the federal government. Barbour was impressed by the pitch made by Khosla and Fred Cannon, KiOR's CEO. A few months later he led the way, and Mississippi's legislature passed a law that cleared the path for a \$75 million loan. In return, KiOR promised to spend \$500 million and build three biofuel factories in the state, use Mississippi-grown timber, and create more than a thousand direct and indirect jobs by the end of 2015.

### "A VERY VISIONARY MAN"

**T**HE BIOFUEL THAT would face its crucible in Mississippi actually began its journey in Holland. In 2005, Dutch chemical engineer Paul O'Connor left his job at chemical giant Albemarle to launch a startup called BIOeCON. His plan was to apply a process used in the oil industry to make biofuels.

The technology, called "catalytic cracking," uses a catalyst to break down biomass, such as wood chips. Many companies and researchers at the time were—and still are—searching for a way to produce fuels using plant waste rather than inefficient corn or other sources that can put stress on food supplies.

Around that time the venture capitalists of Silicon Valley, who had made billions of dollars funding computing and Internet startups, were looking for the next big thing. In 2006, when O'Connor began seeking financing, Silicon Valley's wallet was wide open. Khosla Ventures was one of the most aggressive in its focus on clean tech.

O'Connor managed to secure a meeting with another Khosla Ventures partner and flew to California. During the meeting, he asked if he could get the ear of the name partner himself and was offered five minutes with Khosla the next morning.

In his quick pitch that morning O'Connor de-

scribed the catalytic cracking process. Khosla happened to be looking for something like that to round out his firm's biofuels portfolio. He was interested.

After months of due diligence, the two sides agreed on a deal, and in 2007 they launched KiOR. (The name doesn't mean anything; it was just one of many four-letter names Khosla Ventures had trademarked.) Soon after, they recruited O'Connor's former boss at Albemarle, Cannon, to lead KiOR. Samir Kaul, a Khosla Ventures colleague, joined KiOR's board and became Khosla's partner on the project.

One of the most fateful decisions occurred even before the company was founded. O'Connor was considering licensing his technology to a big oil company. But Khosla—who can be almost as brusque and certain in his conclusions as he is intelligent—disagreed, according to O'Connor. He argued that there was no reason to solicit VC funding if O'Connor planned to sell the technology.

Khosla's ambition was much bigger. He wanted to make KiOR a producer—a biofuel version of Exxon. That would require massive capital expenditures and huge teams with extensive technical know-how. O'Connor agreed, and says he relinquished a research and development agreement he had struck with Petrobras and stopped pursuing technical discussions with Chevron.

The stakes had been raised before the game even began. "Vinod is a very visionary man," says O'Connor. "Maybe too visionary."

### KHOSLA-STYLE ENGINEERING

**K**HOSLA HAS LONG played very active roles in companies and relentlessly challenged them. He explained his strategy in a 2011 Harvard Business School case study that examined his biofuel investments. Khosla said he considers what he does not so much venture capital as "venture assistance."

Khosla and Kaul also helped the company bring in managers in a process that Khosla calls "gene-pool engineering," and still uses today. The idea is that the initial team should know the industry well enough to be able to operate within it but also be outside of the industry enough not to be constrained by its traditional thinking. The group

**"VINOD IS  
A VERY  
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O'CONNOR.  
"MAYBE TOO  
VISIONARY."**

should be able to thrive in “guided chaos.”

Different parties disagree about which side was responsible—Khosla Ventures or O’Connor and the CEO—but most agree that KiOR made poor hiring decisions as it staffed up. The result was a relative preponderance of lab researchers with Ph.D.s and a dearth of people with technical, operational experience running energy facilities. The lack of people with real operational experience “hurt KiOR a lot,” says O’Connor.

The venture capitalists and the executives took another step that would put pressure on the company: selling KiOR stock to the public. That would subject the company to the scrutiny and burdens of the markets and outside shareholders—before it had ever sold a single drop of fuel.

Signs of tension were already emerging inside the company. One KiOR executive allegedly told Khosla in 2010 that the company wasn’t ready for a public offering because its technology was not yet fully developed, according to filings in the shareholder litigation.

Many strategies the venture capitalists employed at KiOR are commonplace in Silicon Valley. They tend to work in the computing and Internet

realms, where top engineers are easy to find and startups often grow and launch products incredibly quickly. These approaches can allow tiny software startups, such as Uber and Skype, to upend massive industries. But inventing and producing a new fuel is more complex by orders of magnitude, the time frame is dramatically longer, and the budgets are astronomically larger.

In late 2010 and early 2011, KiOR’s future seemed to glow. On May 12, 2011, the company held a groundbreaking ceremony at the Columbus facility. Barbour and local politicians donned white construction helmets and posed for photos with shovels. A local elementary school choir performed. The governor called the factory a “game changer for our country.” He described KiOR’s process as “almost like making gold out of straw,” according to the local newspaper.

Three days later came a less public event, but one that would cost a potentially huge support: KiOR suspended an application for \$1 billion in federal loan guarantees. The reasons for the company’s decision are murky, but it meant KiOR needed to ramp up its fundraising.

In light of that, its ability to raise \$150 million in an IPO, which happened the next month, offered some relief. But there were at least a few hints that the market was skeptical of Khosla’s baby: KiOR had hoped to raise more and had to trim back when investors showed limited enthusiasm. Still, the company was on its way. Now all KiOR had to do was develop and sell commercially viable biofuel.

## THE RISE AND FALL OF A GREEN FACTORY

**K**IOR’S IPO DOCUMENTS stated that the company had crossed a crucial threshold: KiOR said it was able to turn a ton of biomass (technically a “bone-dry ton,” or BDT) into 67 gallons of fuel. At that yield, the company would eventually be able to produce its fuel for \$1.80 a gallon and compete with traditional gasoline. During investor calls in 2012, CEO Cannon said KiOR expected to achieve 72 gallons at a larger commercial production facility in the future and would aim to reach 92.

The problem was that the company wasn’t regularly producing anything close to 67, much less 92. In the summer of 2011, after the company’s IPO, its new chief operating officer, Bill Coates, told management that it appeared that the com-



KiOR CEO Fred Cannon (holding jar) at a 2010 news conference with Mississippi Gov. Haley Barbour announcing the company’s plans to build a factory in the state



pany had grossly overstated its yields, according to a KiOR consultant who spoke with him and was quoted in the state's court papers.

Coates's worries fell on deaf ears, according to the consultant. The conflict escalated, and the COO accused his fellow executives of malfeasance, claiming they had "cooked the books." Coates told the executives he was not "going to be part of this scam." A short time later he resigned, signed a nondisclosure agreement, and left with a year's salary and other benefits.

The fight wasn't visible to the outside world. Indeed, at that point in 2011, KiOR's stock was trading high, and two other Khosla Ventures-backed biofuel companies also went public. Another two filed for IPOs before the end of the year (but later pulled their offerings). Khosla proclaimed in a speech at the time that his fund's biofuel portfolio contained about \$1 billion in "liquid profits."

November 2012 brought more good news when KiOR announced it had made its first biofuel at the Columbus factory. That caused Cannon—the soft-spoken, deferential CEO—to declare it "the world's first cellulosic gasoline and diesel fuel products." In an earnings call that day, CFO John Karnes said KiOR would be able to meet its target of selling between 500,000 and 1 million gallons of fuel before the end of the fiscal year.

That's not at all how it played out. The facility was bedeviled by production problems. The conveyor mechanism that delivered wood chips was often on the fritz. Cleaning systems routinely jammed with a tarlike substance. The company spent tens of millions of dollars more than it had expected, and its researcher-heavy staff couldn't untangle the problems.

Five months later KiOR revealed that it hadn't shipped *any* biofuel in 2012. The facility hadn't yet reached a point of steady production.

An odd pattern soon emerged: gloomy news paired with sunny projections. In KiOR's earnings call in March 2013, Cannon said the company had only just shipped its first commercial fuel the day before. He was "disappointed" that the factory had missed its 2012 target, but KiOR had encountered "unexpected startup issues unrelated to our technology," which they had since "overcome."

The company continued issuing bullish estimates. On May 9, 2013, Cannon said the factory was running as expected and cited a production rate that put it on track to hit its 2013 target of

making between 3 million and 5 million gallons.

But KiOR was still not shipping fuel regularly. And even when it managed to do so, KiOR's yields were only a fraction of 67 BDT. Its two plants were routinely producing between 20 and 40 gallons per ton.

Concerns were rising internally. An experienced chemical engineer named Mark Ross joined KiOR in Texas in the summer of 2013 to help fix its endless technical snafus. He visited the Columbus factory multiple times, and when he found that the yields were closer to 22 gallons per BDT, he quickly grew worried, according to a sworn statement he later filed as part of a whistleblower complaint he submitted to the Department of Labor.

Ross asked questions about the yield discrepancy so frequently that he earned the nickname "Dr. Doom." At one point, according to his sworn declaration, he told a superior that the public yield data was so different from the actual data that he believed the company was "lying and cheating the investors." Ross was fired in January 2014 because of what KiOR described as a safety violation. (Ross entered an area of the factory without a permit.) His whistleblower complaint was later dismissed.

KiOR's co-founder, O'Connor, and a senior scientist, Dennis Stamires, also began to worry about the yield discrepancies, according to Mississippi's pleadings. O'Connor departed as a full-time employee early on but says he sent a series of emails to Khosla expressing his fears. In early 2014, Khosla brought O'Connor back as a consultant to review the technology and production.

Even as KiOR struggled to achieve effective production at its Columbus factory, it was also planning a second, larger factory in Natchez, Miss. That factory would also cost hundreds of millions of dollars to build, and the company could get financing for it only if it showed that the technology was working well at Columbus.

It wasn't. KiOR had once again tripped up, as it revealed in an earnings call in August 2013. Its output was 75% below its minimum target.

Finally, near the end of 2013, the company began unraveling. Rice quietly resigned from the board, issuing a statement that she had too many

**KIOR'S YIELDS WERE SO MUCH LOWER THAN WHAT EXECES SAID THAT ONE EMPLOYEE ACCUSED THEM OF "LYING AND CHEATING THE INVESTORS."**



Foreground, the Mississippi pine used to produce bio-fuel at KiOR's facility

commitments. KiOR disclosed that it had been hit with a securities class-action lawsuit. The company's CFO resigned a few months later. Its stock cratered by 90% from its IPO price. In March 2014, KiOR revealed it had been subpoenaed by the SEC and had to disclose that it didn't know if it could continue as a "going concern."

Khosla tried to prop up the company, announcing \$100 million worth of equity commitments (including a reassuring contribution from Bill Gates).

But it wasn't enough to fix the problems at Columbus, and at the beginning of 2014, KiOR closed the plant. Cannon shared the bad news with investors: "We have learned from a year of operating the Columbus facility that additional work is required to bring Columbus from its current performance... with a yield in the low 30s in terms of gallons per ton."

With a shuttered plant, no revenue from fuel sales coming in, and loan payments looming, the company ran out of money and time. It tried and failed to find a buyer. Then, in November 2014, KiOR filed for bankruptcy.

## THE AFTERMATH

**N** O BIOFUEL STARTUPS have managed to produce a next-generation biofuel at commercial scale in the U.S. The capital costs have simply been too high, and the time lines too long. The collapse in oil prices has only made the challenge more daunting.

The list of biofuel startups backed by Khosla

Ventures now reads like a catalogue of disappointments, vaporizing hundreds of millions of the firm's money, along with millions in government funds. Range Fuels built a cellulosic ethanol plant using Khosla funding and millions from the DOE and the USDA. The company shut its factory in 2011. Another half-dozen biofuel startups backed by Khosla Ventures have failed to deliver significant results.

Two of the ones that looked successful early on, Gevo and Amyris, both went public. But today their shares are trading at a fraction of their initial value. In 2012, Amyris decided to move away from biofuels and focus on higher-margin specialty products. Other biofuel companies have done the same. One Khosla-backed biofuel company that has shown promise is LanzaTech, which turns industrial waste gases into biofuels and biochemicals. It has a demonstration-scale plant in China and plans for a commercial facility there.

Fewer than 2 million gallons of cellulosic biofuel were produced in the U.S. in 2015, according to the EPA. That's a small fraction of the 3 billion gallons the agency had predicted in 2007 would be produced this year. Only four cellulosic fuel plants have been built and are in the commissioning phase in the U.S., according to Bloomberg New Energy Finance. All were built by large companies, including DuPont and INEOS. Looking at those numbers, KiOR accomplished something remarkable: It made close to a million gallons of cellulosic fuel in a year, something almost no other company has done in the U.S.

The drama will continue to play out. Mississippi's litigation against Khosla and the KiOR executives is now waiting for a judge to decide whether it will be fought in the federal bankruptcy court in Delaware (where the defendants would like it to occur) or in a district Mississippi court, where Hood wants it. "The deal was done here. Everything was done here," the attorney general says.

Once the litigation clears, O'Connor and others dream that KiOR's technology can eventually succeed. Indeed, Khosla's willingness to purchase the remnants of the company suggests he still believes in the technology. Can he still engineer a bio-Exxon in the future? It's a long shot. But if the size of the failure equals the magnitude of the educational payoff, then KiOR will have been a very valuable lesson indeed. **FT**

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# THE BEST IN BUSINESS 2015

THERE WAS A LOT TO LOVE IN A YEAR THAT GAVE US THE APPLE WATCH, A MALARIA VACCINE, AND A NEW STAR WARS MOVIE. BUT IT WASN'T ALL TAYLOR SWIFT SINGLES AND 24-HOUR ACCESS TO EGG MCMUFFINS.

HERE, THE HIGHEST HIGHS AND LOWEST LOWS OF A REMARKABLE YEAR.

By Scott DeCarlo, Erika Fry, Claire Groden, Stacey Higginbotham, Tom Huddleston Jr., Beth Kowitt, Laura Lorenzetti, Tory Newmyer, Geoffrey Smith, Anne VanderMey, and Jen Wiczner

## THE BEST & BIGGEST 2015

### NEST EGG POLISH

Jeff Bezos added \$29.7 billion to his net worth, bringing it to \$58.3 billion.



### FINANCIAL HIT

Carlos Slim Helú lost \$13.7 billion. He's now worth only \$58.6 billion.



### COMMODITY

Cocoa proved immune to the larger commodities slump (see Chartist).

PRICE FOR ONE TON OF COCOA BEANS

JAN. 2015  
\$2,656

NOV. 2015  
\$3,077

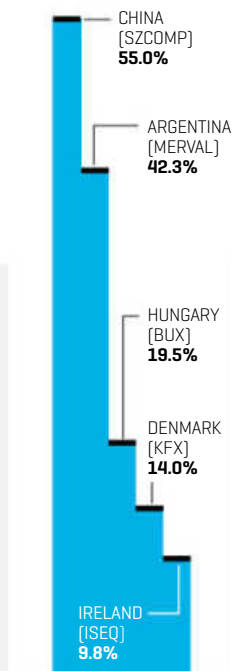


## BIGGEST GLOBAL HEALTH BREAKTHROUGH

### Malaria Vaccine

IT'S TAKEN 30 YEARS and more than \$565 million to make it happen: the first-ever malaria vaccine. The inoculation, called Mosquirix, is the first of its kind to fight a parasite and has the potential to transform the lives of millions.

An estimated 500,000 people die from the disease every year—most of them children. In clinical trials Mosquirix reduced malaria cases by about 40%. Magic bullet? No, but it's big progress against a tropical disease that has received relatively little attention and funding from drugmakers. Mosquirix's manufacturer, GlaxoSmithKline, views it as a "first-generation vaccine," says Moncef Slaoui, head of its vaccine division. A more effective follow-up drug is already in the works.



## BEST-PERFORMING INDEX

### Shenzhen Composite

THE SMALLER OF CHINA'S two main indexes, weighted toward the country's young firms, was 2015's top major index. The S&P 500? Mostly flat.

## BEST REUNION

Star Wars cast. Finally, the movie audiences have been looking for. Merchandise sales alone could hit \$5 billion in its first year. U.S. and Cuba. Renewed diplomatic ties could end 55 years of embargo.

RUNNER-UP:

U.S. and Cuba. Renewed diplomatic ties could end 55 years of embargo.

## MOST INDISPENSABLE GADGET

### Amazon Echo\*

AMAZON REPORTED \$500 MILLION more in revenue than analysts expected last quarter. We're not saying it was because of the year-old Amazon Echo, but this \$179.99 device has been one of the most successful products launched by the online retailer. The cylindrical speaker contains seven microphones and listens for your queries and commands. It also

answers questions, controls most connected home gadgets, plays bingo, and recites your schedule. Sure, it sometimes has trouble with queries (it can't define "aubergine," for example), but the best part is, it gets smarter all the time. Think of it as Amazon's first step in the race for electronic personal assistants.



BEZOS: ALLEN RIZOVSKY—GETTY IMAGES; SLIM HELÚ: INTL COON—AP/GETTY IMAGES; AMAZON ECHO: COURTESY OF AMAZON; STAR WARS CAST 2015: RICHARD SHOTWELL—INVISION/AP; STAR WARS CAST 1977/1980: ALL COURTESY OF LUCASFILM LTD. & TM; CHART SOURCES: INTERNATIONAL COCOA ORGANIZATION; BLOOMBERG



CARRIE FISHER



MARK HAMILL



HARRISON FORD



#### BUILDING

**Shanghai Tower.** China is now home to the world's second-tallest building (after Dubai's Burj Khalifa). At 2,073 feet, it's 65% taller than the Empire State Building.



#### AD

**"Friends Forever."** Android's ad featuring adorable interspecies couples got more than 20 million views on YouTube and 6 million shares on social media, more than any other.



#### MOST IMPRESSIVE BUST

### The West Virginia Lab That Exposed VW

**SURELY VOLKSWAGEN FEARED** the competition. Maybe it worried about regulators. But chances are it didn't give a fig about the little lab at West Virginia University testing diesel

cars on American roads. It should have: It was this scrappy, five-man team of mechanical engineers that first caught on to the German giant's emissions-cheating ways, kicking off the biggest business scandal of the year (and possibly the decade). VW, the world's eighth-largest company in 2014, has lost 34% of its market value since the scandal broke in mid-September.



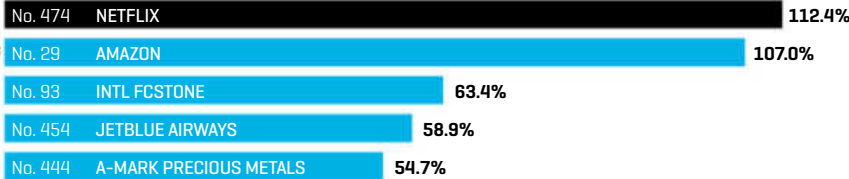
#### BEST DEBATE PERFORMANCE

### Trump? Fiorina? Hardly. It Was Fox News

**FOX NEWS:** 24 million viewers, August  
**CNN:** 23 million viewers, September  
**CNBC:** 14 million viewers, October

**IT MAY NOT** be just chance that when a reality-TV star graced the Republican primary debates,

they broke ratings records. [Donald Trump doesn't think so, anyway.] The first bout, hosted by the Fox News Channel in August, was the most watched ever. Subsequent debates drew less attention, but even the 14 million viewers for CNBC marked all-time-high ratings for that network.



#### BIGGEST GAINERS IN THE FORTUNE 500

**REMEMBER QWIKSTER?** Netflix's 2011 attempt to ditch its rental-by-mail business and focus on streaming ignited mass outrage. Now streaming is ascendant—and so is Netflix. The company's stock price more than doubled this year. Amazon didn't do half bad either.

## THE QUOTES THAT SAID IT ALL



**"We see that privacy is a fundamental human right that people have. We are going to do everything that we can to help maintain that trust."**

—Tim Cook, CEO, Apple



**"Let us not be afraid to say it: We want change, real change, structural change."**

—Pope Francis, criticizing the system of capitalism before his first visit to the U.S. in October



**"Nearly every person I worked with, I saw cry at their desk."**

—Former Amazon employee Bo Olson to the New York Times, in a hotly debated article on the work environment at the e-commerce giant

CLOCKWISE FROM TOP LEFT: GETTY IMAGES; COURTESY OF VOLKSWAGEN; ANDREW HARNIK—AP; JUSTIN SULLIVAN—GETTY IMAGES; DAVID MERCADO—REUTERS; MICHAEL SHORT—BLOOMBERG/GETTY IMAGES; CHART SOURCE: S&P CAPITAL IQ



## CAPITAL GAIN

### Trans-Pacific Partnership

**BIG BUSINESS** faced a stiff challenge to its top D.C. priority—the massive, 12-nation trade deal called the TPP. Labor rallied Democratic opposition while surging populism made traditionally friendly Republicans resistant. But an odd alliance that paired Obama, GOP leaders, and corporate lobbyists eked out a key procedural win for the deal. Next step: congressional approval.

## CAPITAL LOSS

### Immigration and Tax Reform

**CONGRESSIONAL** Republicans consolidated power, but besides nudging trade forward, they couldn't use it for much [thanks, Tea Party]. That meant other priorities that GOP leaders shared with business leaders—think wholesale rewrites of tax and immigration laws—have remained stuck in neutral.

# WHO WON 2015?

SOME VICTORIES ARE SWEETER THAN OTHERS. WE RANKED THE YEAR'S MOST DECISIVE AND MOST IMPACTFUL TRIUMPHS, ON THE Y AND X AXIS RESPECTIVELY.



## GREENBACK GUSHERS

One dollar today can buy you 307 Kazakh tenges—up from 181 in January. It wasn't the only currency that withered against the strong dollar.



## BEST MULTITASKER

Jack Dorsey



**BACK AT THE HELM** of the whimsical social media site, Twitter's co-founder has wasted no time launching new features and cutting staff. He also held on to his other job as CEO of payments company Square. At least he's not the only one distracted by Twitter.

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#### (NON-STAR WARS) ENTERTAINMENT LAUNCH

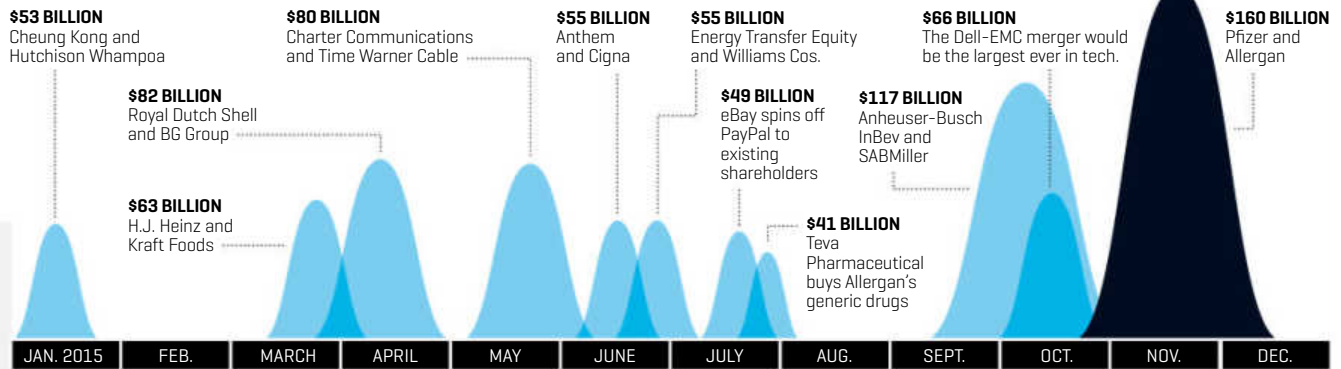
**Fallout 4.** The videogame sold 12 million copies and generated over \$750 million in its first 24 hours, blowing other pop culture releases (sorry, Adele) out of the water.

#### CAMPAIGN SWAG

**The Make America Great Again hat.** Donald Trump's campaign spent \$800,000 on trucker hats and other apparel, its largest expense.



#### VALUE OF LARGEST M&A ANNOUNCEMENTS



## MIGHTIEST MERGERS

**MERGERS AND ACQUISITIONS** in 2015 were at an all-time high, surpassing their 2007 peak, according to Mergermarket. But nothing quite compared with Allergan's head-spinning M&A spree. In the span of one year

it sold itself [to Actavis], kept its name but moved to Ireland, broke itself up [selling Actavis's legacy-generics business to Teva], and announced the year's biggest merger [its pending \$160 billion megadeal with

Pfizer]. Allergan's shareholders might worry that the company was having an identity crisis, if not for the fact that the stock has returned about 19% over the past year, lapping the rest of the pharma industry's meager gains.

#### HOLLYWOOD'S LEADING PLAYER

## Universal

**WHO NEEDS STORMTROOPERS** when you've got dinosaurs? Led by *Jurassic World*, the summer's biggest hit, Universal set a new record for full-year global ticket sales—topping Fox's \$5.5 billion haul in 2014—before the end of August.

But it wasn't all raptors and Chris Pratt. The high-octane thriller *Furious 7* and animated spin-off *Minions* gave Universal three separate billion-dollar blockbusters. The studio also scored a string of surprise box-office smashes, including *Fifty Shades of Grey*, *Pitch Perfect 2*, and *Straight Outta Compton*. Near the end of 2015, Universal was closing in on \$6.5 billion in worldwide sales while boasting more than a 20% share of the global movie market, says research firm Rentrak.

Of course, Universal has some competition from runner-up Walt Disney Studios and its late-December *Star Wars* release. But the studio's many hits built such a lead that even the Force's awakening won't be able to bridge the gap.

#### THE IPO THAT TOLD US EVERYTHING WE NEED TO KNOW ABOUT THE IPO MARKET

## First Data

**THE YEAR'S** biggest IPO marked a comeback for one of the most troubled LBOs in history. First Data's debut wasn't all roses, though. Its shares were priced at the low end of the expected range, par for the course in a year when the most promising companies are staying private.

FALLOUT 4: COURTESY OF BETHESDA GAME STUDIOS; TRUMP: JANE BARLOW—PRESS ASSOCIATION/AP; JURASSIC WORLD, PITCH PERFECT 2, MINIONS: ALL COURTESY OF UNIVERSAL STUDIOS; CHART SOURCE: DEALOGIC

ILLUSTRATION BY DANIELA DE VITO

## EMOJI

"Face With Tears of Joy." It's Oxford University Press's "word" of the year and makes up 17% of all emoji used in the U.S.



## EMERGING MARKET

India. With a 7.21% GDP boost in 2015, India is now growing faster than China, at 6.75%, as estimated by the OECD.

## FOUR-WHEELER



Ford F Series (still). Ford's pickup remains the nation's bestselling vehicle after holding that spot for more than 30 years.

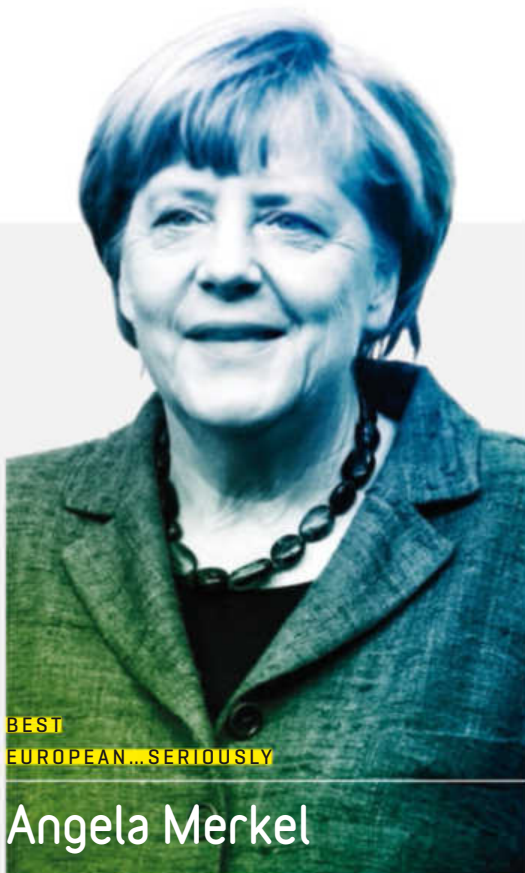
## BIGGEST PAPER GAIN

Airbnb

\$15.5 BILLION?

**THE SHORT-TERM** home rental startup saw its valuation soar from \$10 billion to \$25.5 billion in 2015. It's still dwarfed by Uber, though, which was valued at \$51 billion after an \$11 billion jump.

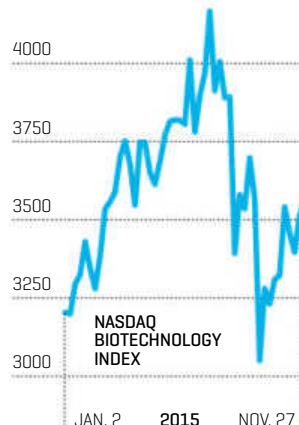
was more important than realpolitik as the migrant crisis washed over an unprepared continent. That powerful show of moral leadership may yet return to haunt her (and her country), but for many thousands it has already meant the difference between hope and despair.



BEST EUROPEAN... SERIOUSLY

Angela Merkel

**NOT ONLY DID SHE MANAGE** to keep the eurozone together in the face of intense provocation from Greek politicians and the extreme reluctance of her own voters, but the German Chancellor gave a voice to all those in Europe for whom charity



## MOST RIVETING FALL FROM GRACE

Valeant, Theranos, Turing, and the Rest of the Biotech Sector

**IT WAS A YEAR** of amazing highs and humiliating lows for biotech companies. The Nasdaq Biotechnology index hit an all-time high early in the year, only to come crashing back down. Public outrage over a drug-pricing scandal (focused on Turing Pharmaceuticals), a federal investigation into business practices at Valeant Pharmaceuticals (among other companies), and questions about the efficacy of the blood-testing technology at Theranos helped drive a selloff in the sector that sent the index plummeting 27% from its peak. Biotech spent the rest of the year slowly climbing back from the loss.

## HYPE INDEX

What We Got Excited About in 2015

### BREATHLESS



THE APPLE WATCH DEBUT

THE INTERNET OF THINGS



MCDONALD'S ALL-DAY BREAKFAST

THE FED'S NON-DECISION ON INTEREST RATES

5% UNEMPLOYMENT



MARCO RUBIO

THE MICROBIOME



ICE MOUNTAINS ON PLUTO

OVERLOOKED

Google

Alphabet

**BEST REORG:** Google becomes Alphabet, restructuring the search giant to extend far beyond search. **SILVER MEDALIST:** HP splits in two, forming one company focused on cloud and enterprise tech, and another on PCs and printers. **BRONZE:** GE is unwinding its finance arm to concentrate on its core industrial operations.



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## The Perks of Postgraduate Studies

**IT TAKES AN ARSENAL OF WEAPONS** to compete in today's rapidly evolving business environment—and on-going education may be the best weapon of all. That's the common reaction of executives who have chosen to hit the postgrad books in mid-career.

Those earning master's degrees, project management credentials, and even Ph.D.s say the return on their investment of time and money has been exponential—and their experiences are backed up by facts. According to the U.S. Census Bureau, people with a master's degree earn \$2.5 million on average over a lifetime—double what a bachelor's holder earns. As well, returnees say the networking opportunities they've encountered and the cross-departmental expertise they've developed has quickly moved them up corporate ranks.

They're also finding it's easier to go back to school, thanks to organizations such as University Alliance, a consortium of 11 universities offering online post-secondary degrees. Their programs are progressive, flexible, and quick to adapt to the realities of the 21st-century workplace, students report. At Oklahoma State University, for example, candidates in the three-year executive Ph.D. stream are learning how to apply both quantitative and qualitative analysis to make data-driven decisions—addressing a critical skill shortage in an increasingly digital world.

"Some of the best practitioners and most advanced thinkers teach in the Ph.D. program," says Toby Joplin, a



graduate of the first cohort in 2014. "It was a terrific learning experience—and one that inevitably leads to fascinating and important work."

Accreditation is also important when job hunting, says Kelly Douglas, who recently studied at Villanova University, through its 100% online professional certificate programs. "I'd been studying on my own for the Project Management Professional (PMP) exam, but I needed some additional educational units to qualify to sit for the exam," she says. "I only had to take one course, but I opted to take the full certification program because it had so much to offer."

Douglas, who won a position as an AVP business analyst with Rabobank, a multinational banking and financial services company, believes her postgrad experience gave her confidence.

Postgrad participants also talk about taking their learning right back to the office, often immediately. Jeff Day says that was his experience.

"If I had a class in leadership strategy, I could apply what I learned in real time at my company," says Day, a graduate of Michigan State's 20-month Master of Science program in Management, Strategy, and Leadership. Day started his studies as a mid-level executive at a tech firm. By the time he finished, he was CEO of a small, agile enterprise.

"Every professor—and every student—helped me in the formulation of my day-to-day strategy," Day says. "I might have paid millions of dollars in consultant's fees to accomplish the same thing I was able to do through my program." ●

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Why municipal bonds may deserve a place in your portfolio. (Page 1)

Why insured bonds often provide an extra degree of security. (Page 2)

Why municipal bonds can potentially provide safety of principal. (Page 3)

How municipal bonds can potentially provide tax-free income. (Page 3)

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*exclusive interview*a conversation *with*  
**TOM GIRARDI**

**Top Ranked Law Firms:** Tom, what a year you've had! Is there anything you're not working on right now?

**Tom Girardi:** Well, we've been very, very lucky. We have just the greatest group of lawyers who work very hard to earn the trust of these great clients we have.

**TRLF:** No question. You have a truly amazing group of attorneys at Girardi | Keese. Tell me about how you came to file the first case against the NFL for player concussions?

**TG:** We were contacted by some former players who were getting very concerned about memory problems. Through our work with leading brain injury specialists, we were able to determine that their years playing football may have caused the problems they were having, and that the NFL has known about this for years.

**TRLF:** What did you hope to achieve for the players in your role as lead counsel?

**TG:** Above and beyond financial compensation, we see it as our job to make sure players get the care they need, so there are no more suicides or drastic measures. That's just the saddest thing. And we want to make sure the NFL is serious about making this great game as safe as it can be. And not just at the pro levels. From Pop Warner on, we need to be proactive about head injuries.

**TRLF:** We've also talked about your concerns about budget cuts to California's courthouses, which are quite severe.

**TG:** We have a crisis going on here. You cannot have justice in a society where we won't pay to keep the lights on in the courthouse. We have to do a much better job of valuing justice, as well as the judges and their staff who work so hard to make sure we uphold our pledge of justice for all.

**TRLF:** And, finally, what about the Bryan Stow case. Could you ever have imagined the Dodgers would be sold to a great group of owners and the case would still be unresolved?

**TG:** There is no question the sale of the Dodgers was one of the great moments in Los Angeles history. I have every confidence the new owners will do everything they can to make sure there will be no more Bryan Stow problems. The obligation to Bryan belongs to the old Dodgers.

**TRLF:** And what about Frank McCourt?

**TG:** As the fans say, 'Good riddance!' Here is a man who took a mountain, made it into a molehill and still made millions. We still have to work with him to get compensation for Bryan and we are hopeful that now that he's done so very well with the sale, he will get serious about his obligations to Bryan Stow and his children.

**TRLF:** And now, three years later, you got to take Bryan Stow's case to the jury. How do you feel about the verdict?

**TG:** The jury did the right thing. And we prevailed on behalf of Bryan, his family and every fan of baseball.

**TRLF:** Tom, thank you so much. Your love of the law is absolutely infectious.

**TG:** Nothing is more important than helping people. I'm so fortunate to be able to do that every day.

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your discovery of Kiawah Island can be the first day of the best of your life.

Obtain the Property Report required by Federal law and read it before signing anything. No Federal agency has judged the merits or value, if any, of this property. Void where prohibited by law. An offering statement has been filed with the Department of State of the State of New York. A copy of the offering statement is available, upon request, from the subdivider. The filing of the verified statement and offering statement with the Department of State of the State of New York does not constitute



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WHILE YOU WERE OUT

# Don't Lose It

Why would you risk your hard-won dough on some exotic bunkum dreamed up by your broker?  
Let me share my secret to investment success.

Hint: It involves a really, really expensive mattress. *By Stanley Bing*

PERHAPS YOU'RE ONE of the smart or lucky people whose money works for them. Sadly, I am not. Maybe my money is just lazy or something. But I have to do it the other way around. I have to work for it.

Nobody pays me like a Kardashian just for showing up at the party. Or rewards me with a nice slice of money pie for sitting on my fundament and advising other people which way the weather is going to turn, whether or not I get it right. Or gives me a tumbler of 23-year-old Pappy Van Winkle to sip as I search for micro shifts in global currencies.

No, my fate, it seems, is to rise at dawn, scrape my face, strap on a monkey suit, and go out the door to labor in the mines until the whistle blows and I can drag my tired carcass back to my little pallet to grab a few hours of rest. Then the next day dawns, and I start it all over again. I don't do it because I love it all the time. I do it because they pay me. That's why they call it a job, I guess. I don't mind it, exactly, but I'll tell you that I certainly do appreciate every dollar I've managed to assemble after years of digging that salt. And losing any of it for any reason whatsoever makes me sort of sick to my stomach.

This powerful drive never to see even a centime circle the drain if I can absolutely avoid it is the central artery that pumps lifeblood into my entire investment strategy. That, paired with my conviction that the market is an irrational monster driven at any moment by other people's greed and fear, has produced certain operating imperatives:

## 1. DON'T LOSE ANY @#\$% MONEY.

Like I said. This, for the most part, means bonds. Value goes up or down, but in the end you get your principal back. That means a lot to me.

## 2. DON'T INVEST IN EVIL.

There are companies that do really lousy things and have a huge negative impact on the world. I don't want to make money on them. Or worse, lose money on them.



## 3. INVEST IN WHAT YOU USE.

For me, this means diet soda, cheeseburgers, and health care. And Apple and Google. Also, there's probably a reason unicorns are extinct.

## 4. DON'T DIVERSIFY.

Every supposed market intellectual says to spread out one's investments across the industrial firmament. Do you know how many people I know who lost a bundle following that BS advice? What a crock! When everything crashes, who loses the most? Idiots who listened to idiots who told them to invest in everything, that's who. Focus! What were we talking about? Oh, yes...

## 5. NEVER BELIEVE THAT THE MARKET IS RATIONAL.


It isn't. The market is stupid, for a variety of reasons. Fear makes you stupid. Greed makes you stupid. Most of all, hope makes you stupid.

## 6. IF YOU WANT TO GAMBLE, GO TO VEGAS.

Have you been? Visit sometime. Stand in the middle of a big casino. Now spend some time wondering how this is different from the investment game. Go ahead. Tell me how.

## 7. LOVE YOUR MONEY.

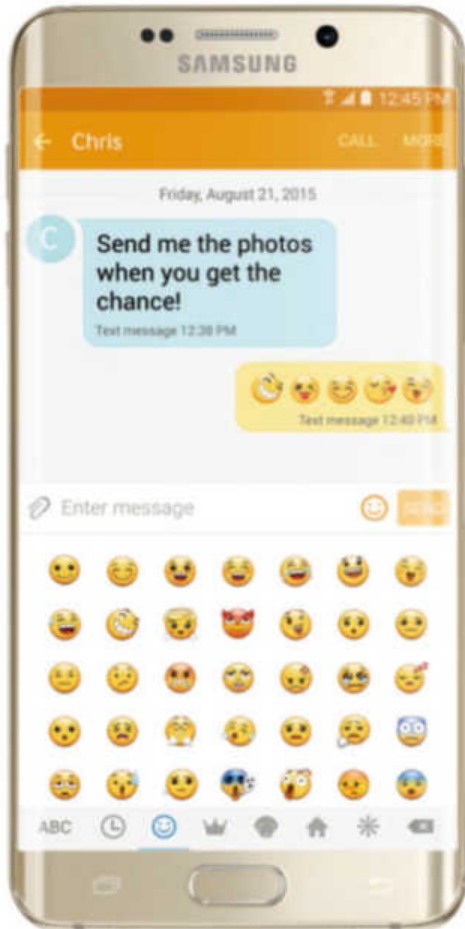
Would you risk your dog for a chance of getting a better one? Would you bet your kids in a poker game? Of course not. Then why would you risk your lovely, delicious, hard-won money on some aspirational bushwa?

In the end, the best investments never really pay off in anything but peace of mind. That's why I'm planning to invest in the best possible mattress I can find. It will help me sleep well, firm in the knowledge that I'm resting on the product of my own labor. There's this handmade model by a Swedish company called Hastens that lists for a mere \$49,500. Steep, I know. But man, that's got to be one fantastic mattress. Think how much cash that baby could hold. 

Follow Stanley Bing at [stanleybing.com](http://stanleybing.com) and on Twitter at [@thebingblog](https://twitter.com/thebingblog).

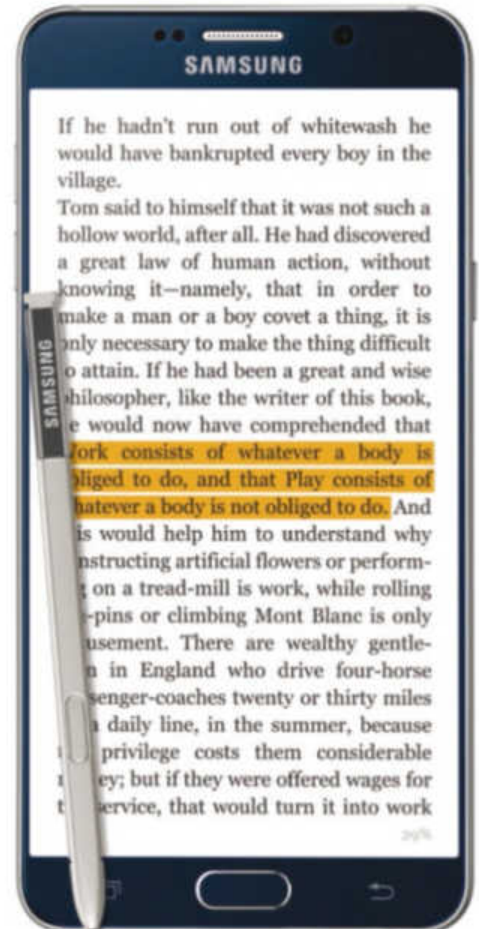
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